

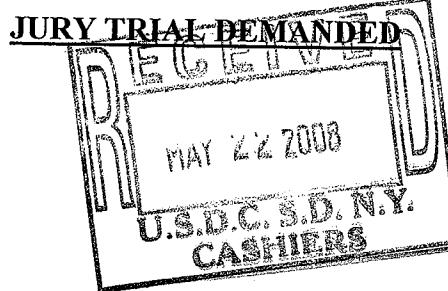
~~JUDGE DANIEL R.~~

'08 CIV 48071

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

-----x
 SERIOUS USA, INC.; SERIOUS IP, INC.;
 and DXPDD, LLC,
 :
 Plaintiffs,

Civil Action No. _____

v.
 :
 INTERACTIVE CARD SOLUTIONS LLC
 and INTERACTIVE CARD
 TECHNOLOGIES LLC,
 :
 Defendants.
COMPLAINT FOR PATENT INFRINGEMENT

Plaintiffs Serious USA, Inc. (“Serious”), Serious IP, Inc. (“Serious IP”) and DXPDD, LLC (“DXPDD”) (Serious, Serious IP and DXPDD collectively “Plaintiffs”) by and through their undersigned counsel, as and for its Complaint for Patent Infringement (the “Complaint”) against Defendants Interactive Card Solutions LLC (“ICS”) and Interactive Card Technologies LLC (“ICT”) (collectively “Defendants”) states as follows:

THE PARTIES

1. Serious is a Delaware corporation with its principal place of business at 495 Broadway, Floor 4, New York, New York 10012.
2. Serious IP is a Delaware corporation with its principal place of business at 495 Broadway, Floor 4, New York, New York 10012. Serious IP is a wholly owned subsidiary of Serious.

3. DXPDD is a Delaware limited liability company with its principal place of business at 495 Broadway, Floor 4, New York, New York 10012. DXPDD is a wholly owned subsidiary of Serious IP.

4. Upon information and belief, ICS and ICT are corporations with headquarters at 10 West 18th Street, 3rd Floor, New York, NY 10011.

5. Upon information and belief, both ICS and ICT were formed pursuant to the laws of the State of Delaware and both have listed as its founding members Corey Perkins (“Perkins”), Casey Archer (“Archer”), and Brent Smith (“Smith”).

6. Perkins, Archer and Smith are all former senior employees of Serious. Between August and October of 2004, Perkins resigned and Archer and Smith were let go due to the formation of ICT, a competitive business, while employed by Serious and using Serious’ confidential and proprietary information.

7. On December 27, 2004, Serious filed a Summons and Complaint and an Order to Show Cause with Temporary Restraining Order in the Supreme Court of the State of New York, New York County, captioned *Serious USA, Inc. v. Casey Archer, et al.*; Case No. 604373/04 (Edmead, J.), against ICT, Archer, Perkins and Smith (collectively the “State Court Defendants”), alleging, *inter alia*, breach of contract, breach of confidentiality agreements, breach of fiduciary duties and unfair competition claims especially with respect to starting the competing ICT business by using Serious’ trade secrets, technology know-how, client contacts, business plan and other confidential information, all while still being employed by Serious.

8. On December 28, 2004, Judge Edmead issued the temporary restraining order requested by Serious against the State Court Defendants. The temporary restraining order prohibited the State Court Defendants from, *inter alia*, participating in any business in the

interactive CD/DVD card industry or contacting, among others, any of Serious' clients, investors, vendors or suppliers concerning any business opportunity.

9. On January 18, 2005, after hearing oral argument, Judge Edmead continued the restraining order against the State Court Defendants.

10. On February 16, 2005, before the Court reached a decision, the parties entered into a Stipulation of Settlement and Order that was filed in the New York County Clerk's Office. The Stipulation of Settlement was so ordered by Judge Carol Edmead (the "Order") and set forth the terms of a temporary injunction (which expired on June 2, 2005) and a permanent injunction. The permanent injunction prohibits the State Court Defendants from using or transferring to others for any competitive purpose any of Serious' intellectual property, including without limitation Serious' marketed CD and DVD products, Serious' licenses, business strategies, supply methods, sales methods and processes, Serious' patents and strategies to acquire patents and other rights, and Serious' confidential information and trade secrets.

11. The Order also provides that Serious is entitled to bring a special proceeding for contempt if the State Court Defendants violate the Order, which proceeding shall be assigned to Judge Edmead.

12. The State Court Defendants violated the Order on multiple occasions and on October 3 2007 Serious brought a special proceeding for contempt of court. Judge Edmead found that the State Court Defendants violated the Order but exercised her discretion to deny Serious' request for damages.

JURISDICTION AND VENUE

13. This action arises under the Patent Laws of the United States, 35 U.S.C. § 1 et seq. This Court accordingly has jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

14. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391(b) and (c) and 28 U.S.C. § 1400(b).

PATENTS IN SUIT

15. On March 29, 2005, United States Design Patent No. D503,404 (the “‘404 Patent”), entitled CD CARD, duly and legally issued to Wood. Serious IP is the owner by assignment of the ‘404 Patent. A true copy of the ‘404 Patent is annexed hereto as Exhibit A.

16. On January 21, 2003, United States Patent No. 6,510,124 (the “‘124 Patent”), entitled CD CARD, duly and legally issued to Wood. Serious IP is the owner by assignment of the ‘124 Patent. A true copy of the ‘124 Patent is annexed hereto as Exhibit B.

17. On July 13, 2004, United States Patent No. 6,762,988 (the “‘988 Patent”), entitled CD CARD, duly and legally issued to Wood. Serious IP is the owner by assignment of the ‘988 Patent. A true copy of the ‘988 Patent is annexed hereto as Exhibit C.

18. On December 11, 2007, United States Patent No. 7,308,696 (the “‘696 Patent”) entitled DATA STORAGE APPARATUS, duly and legally issued to Wood. Serious IP is the owner by assignment of the ‘696 Patent. A true copy of the ‘696 Patent is annexed hereto as Exhibit D.

19. On November 9, 1999, United States Patent No. 5,982,736 (the “‘736 Patent”), entitled TRADING CARD OPTICAL COMPACT DISC AND METHODS OF USING AND FORMING SAME, duly and legally issued to Pierson. DXPDD is the owner by assignment of the ‘736 Patent. A true copy of the ‘736 Patent is annexed hereto as Exhibit E.

20. On October 16, 2001, United States Patent No. 6,304,544 (the “‘544 Patent”), entitled CARD COMPACT DISC, COMPACT DISC INTERFACE SEAT AND METHODS

OF USING SAME, duly and legally issued to Pierson, et al. DXPDD is the owner by assignment of the '544 Patent. A true copy of the '544 Patent is annexed hereto as Exhibit F.

21. On June 20, 2000, United States Patent No. 6,078,557 (the "'557 Patent"), entitled METHOD OF USING OPTICAL COMPACT DISC, duly and legally issued to Pierson. DXPDD is the owner by assignment of the '557 Patent. A true copy of the '557 Patent is annexed hereto as Exhibit G.

22. On January 18, 2000, United States Patent No. 6,016,298 (the "'298 Patent"), entitled CALLING CARD, duly and legally issued to Fischer. Serious is the owner by assignment of the '298 Patent. A true copy of the '298 Patent is annexed hereto as Exhibit H.

COUNT I

Infringement Of United States Design Patent No. D503,404 by ICS and ICT

23. Serious IP repeats the allegations contained in Paragraphs 1 through 22 as though fully set forth herein.

24. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '404 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of their products, including, but not limited to, its iactive giftcard™.

25. Upon information and belief, Defendants have had notice of the '404 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling Serious IP to enhanced damages pursuant to 35 U.S.C. § 284.

26. As a result of Defendants' infringement of the '404 Patent, Serious IP has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

27. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '404 Patent, Serious IP will be irreparably harmed.

28. Upon information and belief, with full knowledge of the '404 Patent, Defendants willfully and wantonly infringed the '404 Patent in deliberate and intentional disregard of Serious IP's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT II

Infringement Of United States Patent No. 6,510,124 by ICS and ICT

29. Serious IP repeats the allegations contained in Paragraphs 1 through 28 as though fully set forth herein.

30. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '124 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactive giftcard™.

31. Upon information and belief, Defendants have had notice of the '124 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling Serious IP to enhanced damages pursuant to 35 U.S.C. § 284.

32. As a result of Defendants' infringement of the '124 Patent, Serious IP has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

33. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '124 Patent, Serious IP will be irreparably harmed.

34. Upon information and belief, with full knowledge of the '124 Patent, Defendants willfully and wantonly infringed the '124 Patent in deliberate and intentional disregard of Serious IP's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT III

Infringement Of United States Patent No. 6,762,988 by ICS and ICT

35. Serious IP repeats the allegations contained in Paragraphs 1 through 34 as though fully set forth herein.

36. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '988 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactive giftcard™.

37. Upon information and belief, Defendants have had notice of the '988 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling Serious IP to enhanced damages pursuant to 35 U.S.C. § 284.

38. As a result of Defendants' infringement of the '988 Patent, Serious IP has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

39. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '988 Patent, Serious IP will be irreparably harmed.

40. Upon information and belief, with full knowledge of the '988 Patent, Defendants willfully and wantonly infringed the '988 Patent in deliberate and intentional disregard of Serious IP's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT IV

Infringement Of United States Patent No. 7,308,696 by ICS and ICT

41. Serious IP repeats the allegations contained in Paragraphs 1 through 40 as though fully set forth herein.

42. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '696 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactive giftcard™.

43. Upon information and belief, Defendants have had notice of the '696 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling Serious IP to enhanced damages pursuant to 35 U.S.C. § 284.

44. As a result of Defendants' infringement of the '696 Patent, Serious IP has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

45. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '696 Patent, Serious IP will be irreparably harmed.

46. Upon information and belief, with full knowledge of the '696 Patent, Defendants willfully and wantonly infringed the '696 Patent in deliberate and intentional disregard of Serious IP's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT V

Infringement Of United States Patent No. 5,982,736 by ICS and ICT

47. DXPDD repeats the allegations contained in Paragraphs 1 through 46 as though fully set forth herein.

48. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '736 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactivecard™.

49. Upon information and belief, Defendants have had notice of the '736 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling DXPDD to enhanced damages pursuant to 35 U.S.C. § 284.

50. As a result of Defendants' infringement of the '736 Patent, DXPDD has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

51. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '736 Patent, DXPDD will be irreparably harmed.

52. Upon information and belief, with full knowledge of the '736 Patent, Defendants willfully and wantonly infringed the '736 Patent in deliberate and intentional disregard of DXPDD's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT VI

Infringement Of United States Patent No. 6,304,544 by ICS and ICT

53. DXPDD repeats the allegations contained in Paragraphs 1 through 52 as though fully set forth herein.

54. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '544 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactivecard™.

55. Upon information and belief, Defendants have had notice of the '544 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling DXPDD to enhanced damages pursuant to 35 U.S.C. § 284.

56. As a result of Defendants' infringement of the '544 Patent, DXPDD has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

57. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '544 Patent, DXPDD will be irreparably harmed.

58. Upon information and belief, with full knowledge of the '544 Patent, Defendants willfully and wantonly infringed the '544 Patent in deliberate and intentional disregard of DXPDD's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT VII

Infringement Of United States Patent No. 6,078,557 by ICS and ICT

59. DXPDD repeats the allegations contained in Paragraphs 1 through 58 as though fully set forth herein.

60. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '557 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactivecard™.

61. Upon information and belief, Defendants have had notice of the '557 Patent as early as August 2004 and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling DXPDD to enhanced damages pursuant to 35 U.S.C. § 284.

62. As a result of Defendants' infringement of the '557 Patent, DXPDD has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

63. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '557 Patent, DXPDD will be irreparably harmed.

64. Upon information and belief, with full knowledge of the '557 Patent, Defendants willfully and wantonly infringed the '557 Patent in deliberate and intentional disregard of DXPDD's rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

COUNT VIII

Infringement Of United States Patent No. 6,016,298 by ICS and ICT

65. Serious repeats the allegations contained in Paragraphs 1 through 64 as though fully set forth herein.

66. Upon information and belief, Defendants have been, still are, and will continue infringing, contributing to the infringement of, and/or inducing the infringement of the '298 Patent in violation of 35 U.S.C. § 271 by making, selling, using and/or offering for sale one or more of its products, including, but not limited to, its iactivecard™.

67. Upon information and belief, Defendants have had notice of the '298 Patent and have acted with reckless disregard as to its infringement, which has been and continues to be willful, entitling Serious to enhanced damages pursuant to 35 U.S.C. § 284.

68. As a result of Defendants' infringement of the '298 Patent, Serious has suffered injury to its business and property in an amount to be determined as damages, and will continue to suffer damages in the future.

69. Unless an injunction is issued enjoining Defendants and their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from infringing the '298 Patent, Serious will be irreparably harmed.

70. Upon information and belief, with full knowledge of the '298 Patent, Defendants willfully and wantonly infringed the '298 Patent in deliberate and intentional disregard of Serious' rights, making this an exceptional case pursuant to 35 U.S.C. § 285.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs pray for judgment and relief as follows:

- A. A declaration that Defendants have infringed, are infringing, have induced and are inducing, and have contributed and are contributing to the infringement of United States Design Patent No. D503,124 and United States Patent Nos. 6,510,124; 6,762,988; 7,308,696; 6,078,557; 6,304,544, 5,982,736; 6,016,298 (collectively, the “patents in suit”);
- B. A preliminary and permanent injunction enjoining Defendants, their officers, agents, servants, employees and attorneys, and all those persons in active concert or participation with them, from further infringement, inducing infringement, and contributing to infringement of the patents in suit;
- C. An award of damages in favor of Plaintiffs and against Defendants sufficient to fully compensate Plaintiffs for Defendants’ infringement of the patents in suit and an assessment of prejudgment interest and post-judgment interest;
- D. A finding by the Court that Defendants’ infringement of the patents in suit is willful, and an award of enhanced damages pursuant to 35 U.S.C. § 284;
- E. Trebling the compensatory damages due Plaintiffs;
- F. A finding by the Court that this is an exceptional case under 35 U.S.C. § 285 and an award to Plaintiffs of their attorneys’ fees, costs and expenses in this action; and
- G. Such other and further relief as the Court deems just and equitable.

Dated: New York, New York
May 22, 2008

DREIER LLP

By:

Seth H. Ostrow (SO 9605)
Arianna Frankl (AF 7764)
Karine Louis (KL 6652)

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Telephone: (212) 328-6100
Facsimile: (212) 328-6101

Attorneys for Plaintiffs Serious USA, Inc.,
Serious IP, Inc. and DXPDD, LLC

DEMAND FOR JURY TRIAL

Serious USA, Inc. hereby demands trial by jury of all claims and issues so triable.

Dated: New York, New York
May 22, 2008

DREIER LLP

By:



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Attorneys for Plaintiffs Serious USA, Inc.,
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EXHIBIT A



US00D503404S

(12) **United States Design Patent** (10) Patent No.: **US D503,404 S**
Wood (45) Date of Patent: ** Mar. 29, 2005

(54) CD CARD

(76) Inventor: **David B. Wood**, 14027 Betsy Ross La.,
 Centreville, VA (US) 20121

(**) Term: **14 Years**

(21) Appl. No.: **29/138,722**

(22) Filed: **Mar. 20, 2001**

Related U.S. Application Data

(60) Provisional application No. 60/062,408, filed on Oct. 14, 1997.

(51) LOC (7) Cl. **14-99**

(52) U.S. Cl. **D14/478**

(58) Field of Search D14/432-3, 435,
 D14/478-80; D6/626-7, 407; 360/60, 129,
 132, 133, 135, 97.01-99.12; 206/312, 307,
 308.1, 308.2, 472; 269/291, 272-3, 77.2

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Primary Examiner—M. H. Tung

(74) Attorney, Agent, or Firm—Robert Platt Bell

(57) CLAIM

The ornamental design for a CD card, as shown and described.

DESCRIPTION

FIG. 1 is a top plan view of a CD card showing my new design;

FIG. 2 is a bottom plan view thereof;

FIG. 3 is a front view thereof, the back view is identical;

FIG. 4 is a right side view thereof, the left side being identical;

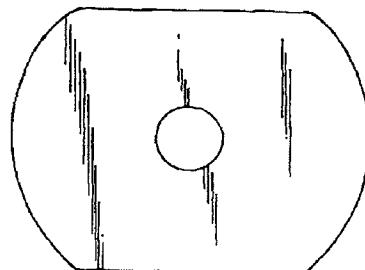
FIG. 5 is a top plan view of a second embodiment thereof;

FIG. 6 is a bottom plan view thereof, the broken line surface ornamentation is for illustrative purposes only and forms no part of the claimed design;

FIG. 7 is a front view thereof, the back view is identical; and,

FIG. 8 is a right side view thereof, the left side being identical.

1 Claim, 2 Drawing Sheets



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U.S. Patent

Mar. 29, 2005

Sheet 1 of 2

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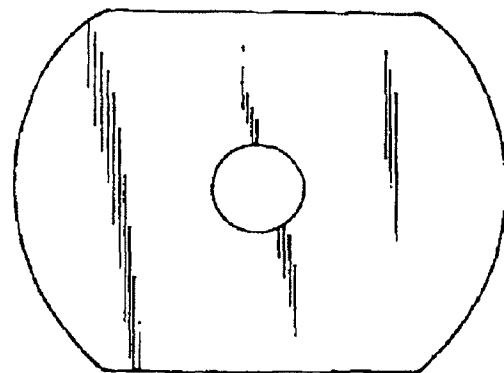


Figure 1

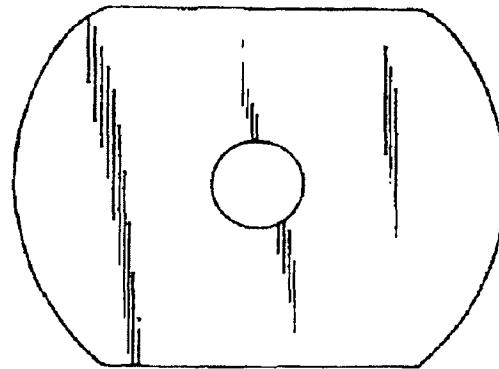


Figure 2

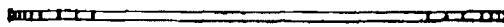


Figure 3

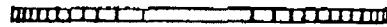


Figure 4

U.S. Patent

Mar. 29, 2005

Sheet 2 of 2

US D503,404 S

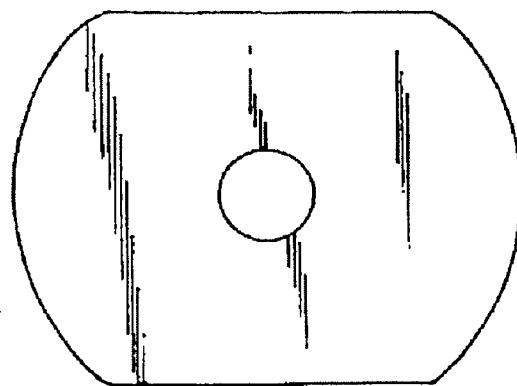


Figure 5

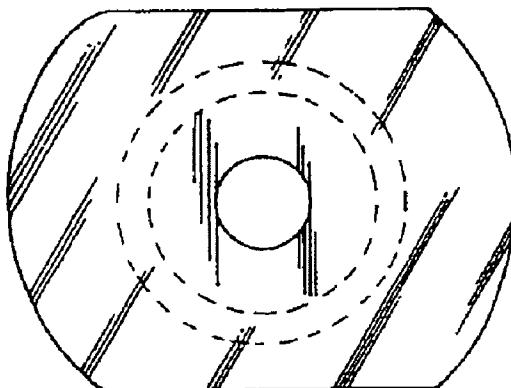


Figure 6

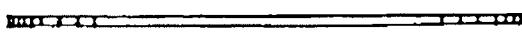


Figure 7



Figure 8

EXHIBIT B



US006510124B1

(12) **United States Patent**
Wood

(10) **Patent No.:** US 6,510,124 B1
(45) **Date of Patent:** Jan. 21, 2003

(54) **CD CARD**

(76) Inventor: **David B. Wood**, 14027 Betsy Ross La.,
Centreville, VA (US) 20121

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/170,040**

(22) Filed: **Oct. 13, 1998**

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* cited by examiner

Primary Examiner—David Davis
(74) Attorney, Agent, or Firm—Robert Platt Bell

(57) **ABSTRACT**

A CD Card for packaging card like information and digital information in the basic dimensions (length and width) of a business, credit or collectors card. The CD Card is made up of one, two, or three major components. The first component is a small compact disc with dimensions small enough to be contained within the typical dimensions (length and width) of a business card, credit card, or collectors card. The second component is a container shaped like a business, credit, or collectors card in length and width, but with a depth large enough to hold the small compact disc and adaptor (if required) discussed subsequently. The third component is an adaptor designed to position the small compact disc of the first and third embodiments of the present invention correctly in standard CD drives. A second embodiment of the small compact disc may not require an adaptor or case. The adaptor also has dimensions small enough to be contained within the typical dimensions (length and width) of a business card, credit card, or collectors card.

(56) **References Cited**

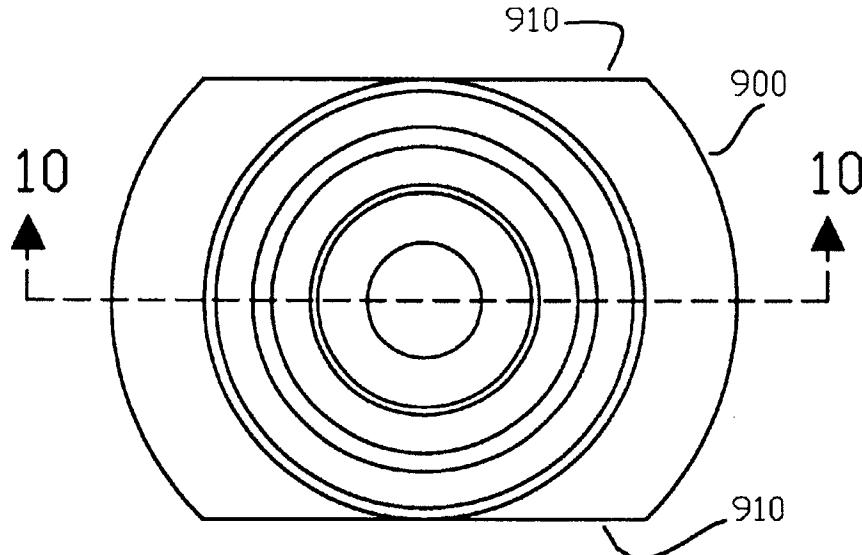
U.S. PATENT DOCUMENTS

1,121,239 A	*	12/1914	Fuller	369/273
4,700,840 A	*	10/1987	Haddock	206/449
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8 Claims, 6 Drawing Sheets



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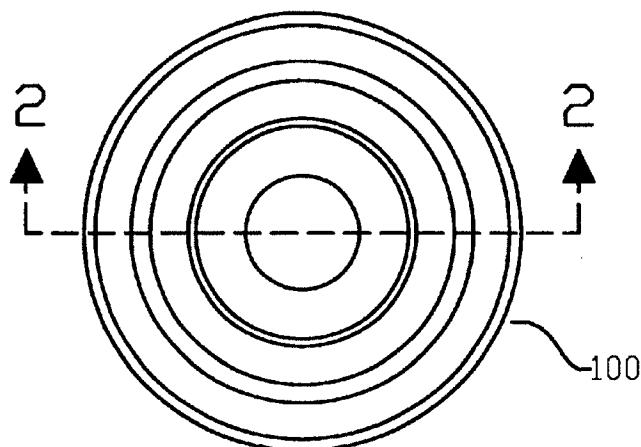


Figure 1



Figure 2

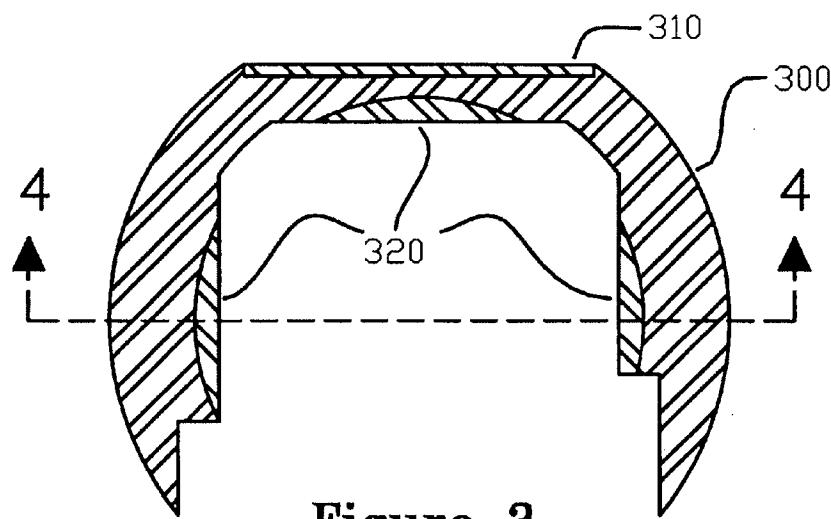


Figure 3



Figure 4

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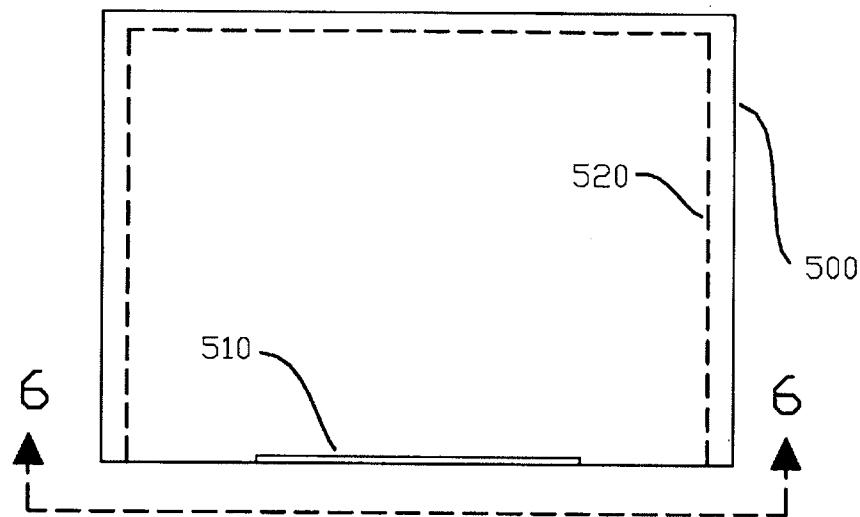


Figure 5

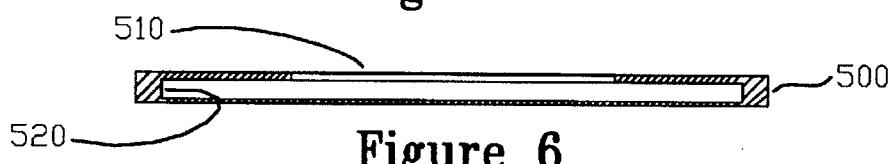


Figure 6

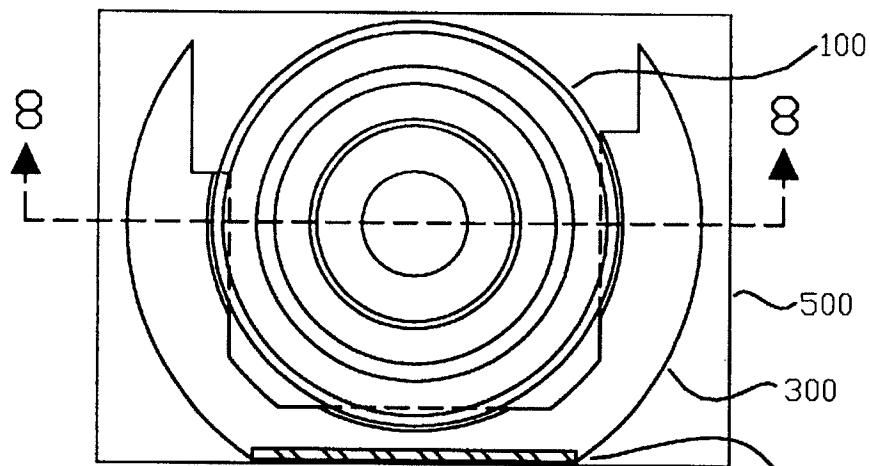


Figure 7

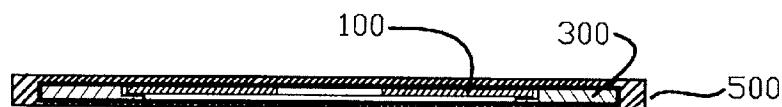


Figure 8

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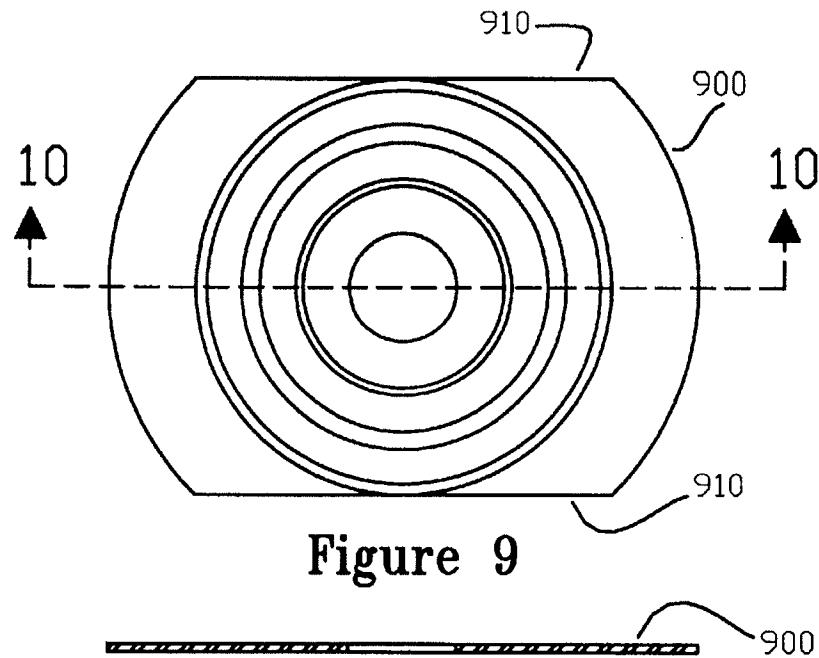


Figure 10

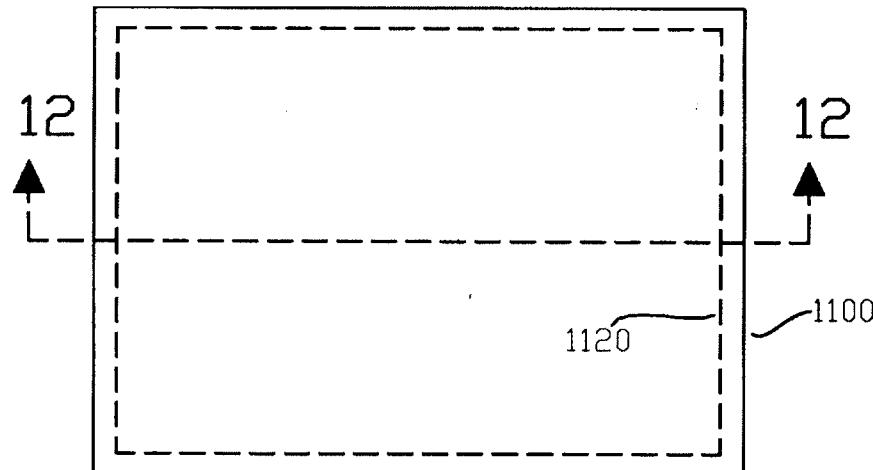


Figure 12

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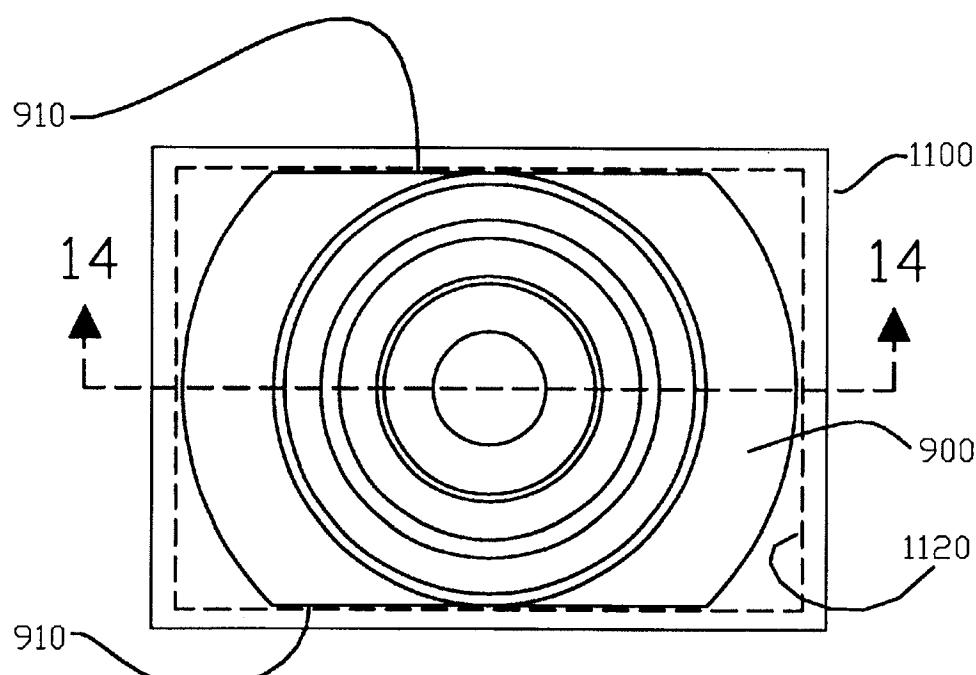


Figure 13

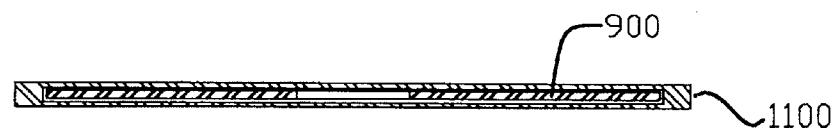


Figure 14

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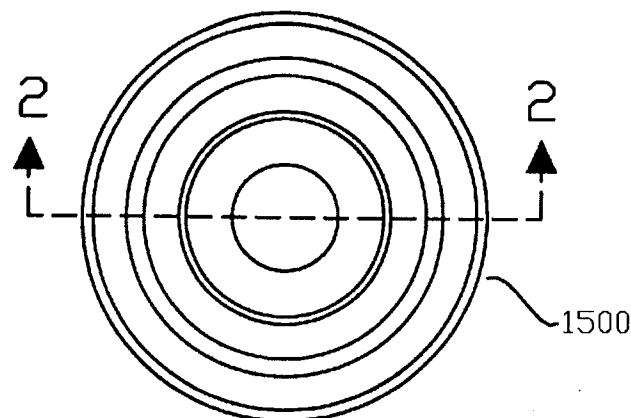


Figure 15



Figure 16

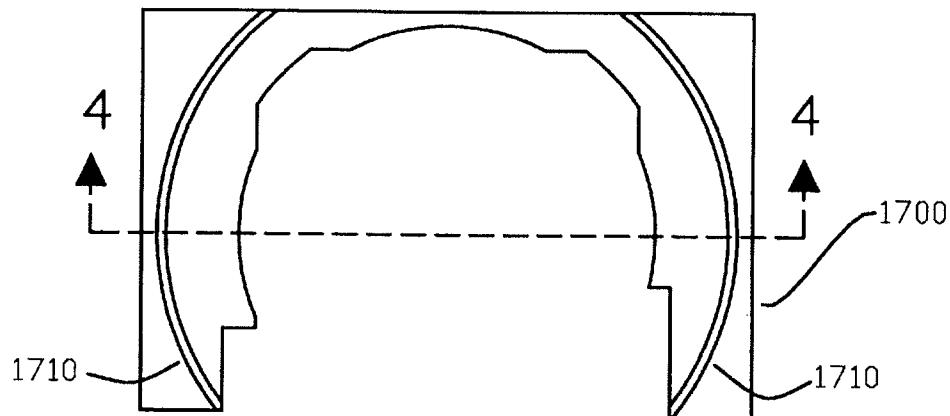


Figure 17

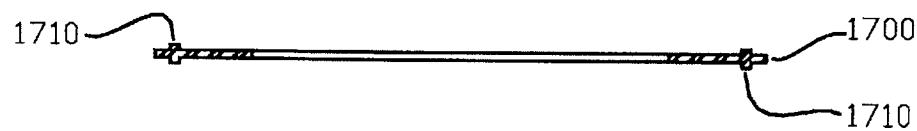


Figure 18

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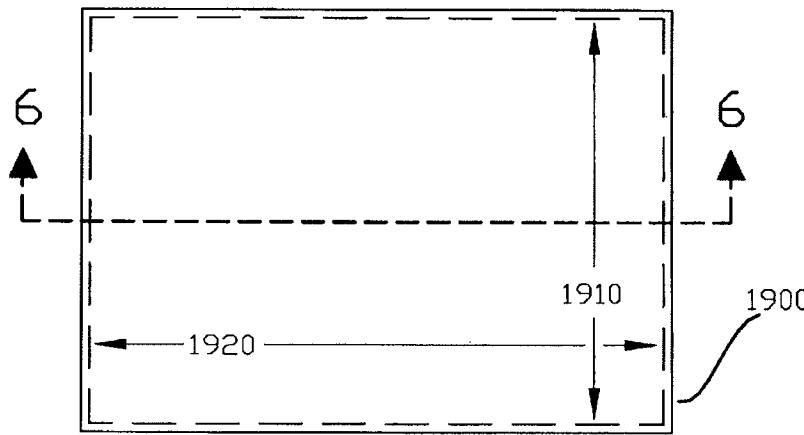


Figure 19



Figure 20

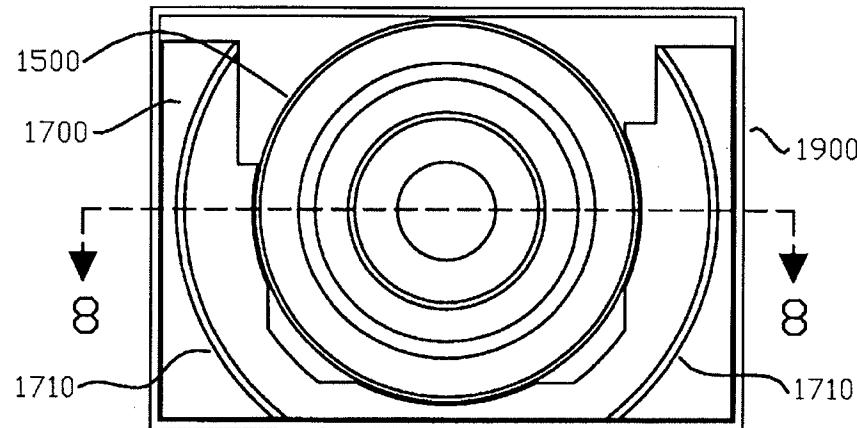


Figure 21

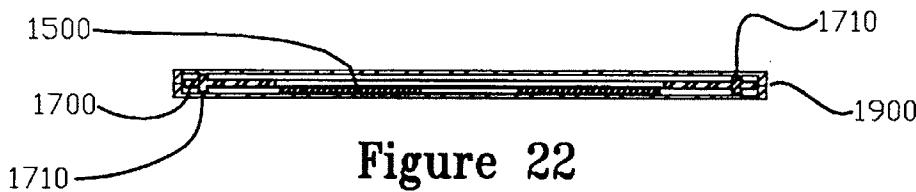


Figure 22

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CD CARD**CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims priority from Provisional U.S. Application Ser. No. 60/062,408, filed Oct. 14, 1997, which is incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to the field of compact disc (CD) data storage, specifically to a method and apparatus for packaging a smaller size compact disc, or a smaller size compact disc and disc adaptor into a credit card, business card, or baseball card/collectors card size.

BACKGROUND OF THE INVENTION

It may be desirable to be able to distribute digital information in a medium as widely accepted and easily carried as a business, credit, or collectors card that can be read or read and written to by a standard CD drive. For example, Spector, U.S. Pat. No. 5,090,561 discusses using a CD-ROM as a baseball collectable (Col. 2, lines 3-10) and provides a case for displaying such collectibles. However, a standard 12 cm CD-ROM is rather large and awkward compared to a standard baseball card, business card, or credit card size format.

It also may be desirable to change the shape of the small compact disc of the invention. It is known that a standard 12 cm in diameter compact disc can be cut (made) to have straight sides and play as a standard 12 cm diameter CD. Such a product is presently marketed under the trade name CyberTract™ and is commercially available through the American Tract Society and made with the cooperation of DISCART™, LLC, which claims copyright to the disc shapes and also claims patents pending.

One such tract, for example, has been marketed using the likeness of the late Mickey Mantle imprinted onto the face of the device. The device is encoded with text, graphics, and video of the late Mickey Mantle discussing his religious conversion. The overall appearance (but not size) of the device is akin to that of a baseball card or collectable, on one side.

The DISCART™ device, however, is made as a cut down (rectangular) version of a standard 12 cm compact disc (CD). This disc maintains the 12 cm diameter at four points to align itself in the CD drive. As a result, the packaged product is larger than a standard baseball card or sports collectable. Thus, products such as the DISCART™ device may not be as readily acceptable for collectors. Such an apparatus, for example, would not fit within standard baseball card holders, drawers, or shelving.

In addition, while the device appears to play satisfactorily in most CD players and CD-ROM drives, after testing the inventor has discovered that the device may create some vibrations or noise when played or used in some CD players or CD-ROM drives. The rectangular shape of the disc creates a slight imbalance or non-aerodynamic shape which may result in vibration in some CD players.

Another approach is a CD-ROM card marketed as "The Card" by ADIVAN High Tech AG, Switzerland (www.adivan.com). The inventor is unaware of the first disclosure date of the ADIVAN device, and thus does not represent that the device qualifies as "prior art" per se. However, the device is disclosed herein under the spirit of the duty of disclosure.

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The ADIVAN device is a CD-ROM provided in a number of shapes and sizes within a specified range. Four "knobs", spaced along a 75 mm diameter circle protrude from the underside of card, to align the card in a CD-ROM drive utilizing the 8 cm depressed portion of the CD-ROM drive tray. The presence of protruding knobs may make the card less useful as a business card device, as the resultant card is no longer flat. As such, storage devices for business cards, baseball cards, and the like, may not readily accept such a card. The knobs also make the card less aerodynamic and cause greater vibration. It would also appear to require a special mold to form the knobs.

One approach to solving such problems might be to use the 8 cm CD of the prior art. It is known that an 8 cm in diameter compact disc made by the Sony Corporation is commercially available. The 8 cm compact disc holds the same type of information that the 12 cm diameter disc can and is playable in standard CD drives. Such CD "singles" have heretofore been used mainly for music applications and the like. However, even an 8 cm CD is too large to fit in a standard baseball or business card size format.

Various adaptors are known in the art for attaching to a 8 cm CD to adapt the 8 cm CD for playback on a 12 cm CD player, much as the old spindle adaptors were used to play 45 RPM records on LP turntables. These adaptors were designed when CD players did not incorporate an 8 cm aligning circle as they do today. Such adaptors were also designed for use in compact disc cartridges (Caddys) which are very rare today. These adaptors are still helpful today in playing 8 cm CDs in multi-disc cartridges and front loading players. 90 to 95% of CD players used today are tray loading drive types with 8 cm aligning circles, making these adaptors unnecessary in the majority of CD players.

Yamamori, U.S. Pat. No. 4,837,784, issued Jun. 6, 1989, discloses one such device. It should be noted that it appears that the device of Yamamori engages the smaller 8 cm disc, thus forming a package which is 12 cm in diameter. Although the device of Yamamori may be suitable for playing back 8 cm discs, the overall structure of the apparatus suffers from some drawbacks.

To begin with, the adaptor has a 12 cm outer diameter. Thus, if the adaptor is distributed with an 8 cm disc, the overall package size would need to be at least 12 cm in diameter, or that of a standard CD case (e.g., so-called "jewel box"). It also requires excess handling of the 8 cm disc and the possibility of disengagement of the adaptor from the disc resulting in damage to the disc or the disc drive.

Eihaus, U.S. Pat. No. 4,889,330, issued Feb. 6, 1990, Published EP application 0,331,389, published Sep. 6, 1989, and EP Patent Specification 0,391,638 published Apr. 19, 1995, all disclose similar CD adaptors for adapting an 8 cm CD to a 12 cm format. However, all of those devices appear to suffer from the same fundamental limitations of the Yamamori device. In particular, the overall size of such adaptors precludes them from being packaged into a package substantially smaller than a standard 12 cm CD-ROM. Moreover, such devices appear to physically attach to the CD-ROM itself.

Yamashita et al., U.S. Pat. No. 5,457,677, issued Oct. 10, 1995, discloses an adaptor for a smaller CD for use in a multi-CD adaptor. The device grips the smaller CD which is then removed from the adaptor laterally by the playback apparatus. Such a device may not be readily adaptable to a tray-type CD-ROM player or the like.

Typical CD-ROM drives with opening trays may be provided with a depressed inner portion which may be used

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to center an 8 cm CD-ROM. Once the CD-ROM is placed in this depression, and the tray closed, the spindle of the CD-ROM drive may engage the center hole of an 8 cm CD-ROM successfully and the 8 cm CD-ROM may be read. Without such a depression, the 8 cm CD-ROM may slide about when the tray is closed, and the spindle may not properly engage, possibly damaging or scratching the 8 cm CD-ROM.

While such a solution may work for an 8 cm CD-ROM, it may not work for other, odd sizes. Given the large installed base of CD-ROM drives, one wishing to distribute a non-standard (e.g., diameter other than 8 cm or 12 cm) CD-ROM size, one cannot expect users to buy new CD-ROM drives with yet a second depression for yet another size CD-ROM.

SUMMARY OF THE INVENTION

In a first embodiment, the present invention may utilize a small compact disc, smaller than the standard 12 cm diameter CD, that will fit inside a card shaped container (if desired). In accordance with the invention, a CD Card device for packaging digital information in a medium as widely accepted and easily carried as a business, credit or collectors card that can be read (or read and written to by drives and disc types so capable) by standard CD drives comprises a small compact disc. This small compact disc is smaller than the standard 12 cm in diameter compact disc commonly used today and the 8 cm compact disc referred to in the Background of the Invention Section above.

The small compact disc of the present invention uses the same technology (materials, and data standards) as does the standard 12 cm diameter CD with the only significant exception being its outside diameter (in a first and third embodiments) or its shape (in a second embodiment). Also, weight may be added to the small compact disc of either embodiment by adding heavier materials and/or increasing the thickness of some outer areas.

The small CD of the present invention may store any data that is stored on a standard 12 cm compact disc, and be read or read and written to if so designed, like any standard 12 cm disc so capable. This is possible because all critical information to allow the proper use of a CD is carried in the innermost part of the area that carries information. Such information falls within the diameter of the small compact disc of the invention. The small compact disc of the invention requires only proper placement in the standard CD drive to perform properly.

The first and third embodiments of the present invention may require an adaptor to ensure proper placement. This adaptor is discussed in the following paragraph. The second (and preferred) embodiment of the invention may not require an adaptor to assure proper placement. Both small compact discs, one embodiment of which may be approximately 5.5 to 6.35 cm in diameter in the case of the first and third embodiments and the other having an approximate width of 5.5 to 6.35 cm and a length of 8 cm in the case of the second (and preferred) embodiment, will have less storage capacity than the standard 12 cm in diameter compact disc.

An adaptor is designed for use with the first and third embodiments of the present invention. The adaptor is designed to position the small compact disc of the first and third embodiments correctly so that it will be accepted by the CD drive. The adaptor is also stored within the card shaped container. One embodiment of the adaptor may stretch across (over) the 8 cm disc aligning circle (available with tray loading CD drives), being kept in position by protruding

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arc shaped ridges. In this position it will align the small compact disc for proper use.

First, the adaptor is placed in the CD drive tray, then the small compact disc is placed within it. The adaptor will remain in its initial position in the tray as the small compact disc is lifted out of it by the drive mechanism for use. The small compact disc will be returned to the adaptor by the drive mechanism when the small compact disc is no longer in use.

The small compact disc of the second embodiment (and preferred) of the present invention, when placed in the tray, will be in the proper position as a result of its shape.

A card shaped container may hold the small compact disc in a manner to protect it from the casual handling that is common to business, credit and collector cards, the type of handling that could damage a compact disc. It also may hold the adaptor (in the first and third embodiments) used to position the small compact disc. The container permits removal and replacement of the small compact disc (and the adaptor, in the first and third embodiments) from within the card. The card may be designed to display information similar to a credit, business or collectors card on its surfaces.

In its preferred embodiment the CD card may be offered as a digital collectors card, for example a baseball, football, or basketball card. It may also be offered as a digital card displaying the common sights at vacation areas to remind vacationers of their trip while using their computer. One way in which the information may be displayed is in the format of a screen saver. The card may also be used as would a conventional business card but with the added dimension of conveying large amounts of digital information to its recipient. There are many possible uses for the CD Card only some of which are described here.

It is known that in a small percentage of CD drives (less than 5%) a larger adaptor for the first and third embodiments or a newly designed adaptor for the second embodiment may be needed. If it is desired that the smaller compact discs be read in those CD drives, a special larger adaptor may be provided.

BRIEF DESCRIPTIONS OF THE DRAWINGS

In order that the invention may be readily carried into effect, it will now be described with the accompanying drawings wherein:

FIG. 1 is a top plan view of a first embodiment of the small compact disc of the present invention.

FIG. 2 is a cross-section view taken along lines 2—2 of FIG. 1.

FIG. 3 is a top plan view of a first embodiment of the adaptor of the present invention.

FIG. 4 is a cross-section view taken along lines 4—4 of FIG. 3.

FIG. 5 is a top plan view of a first embodiment of the card shaped container of the present invention.

FIG. 6 is a cross-section view taken along lines 6—6 of FIG. 5.

FIG. 7 is a top plan view of the first embodiment of the present invention of the card shaped container with the adaptor and small compact disc carried inside.

FIG. 8 is a cross-section view taken along lines 8—8 of FIG. 7.

FIG. 9 is a top plan view of a second (and preferred) embodiment of the small compact disc of the present invention.

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FIG. 10 is a cross-section view taken along lines 10—10 of FIG. 9.

FIG. 11 is a top plan view of a second embodiment of the card shaped container of the present invention.

FIG. 12 is a cross-section view taken along lines 12—12 of FIG. 11.

FIG. 13 is a top plan view of a second embodiment of the present invention of the card shaped container with the small compact disc carried inside.

FIG. 14 is a cross-section view taken along lines 14—14 of FIG. 13.

FIG. 15 is a top plan view of a third embodiment of the small compact disc of the present invention.

FIG. 16 is a cross-section view taken along lines 2—2 of FIG. 15.

FIG. 17 is a top plan view of a third embodiment of the present invention illustrating an adaptor.

FIG. 18 is a cross-section view taken along lines 4—4 of FIG. 17.

FIG. 19 is a top plan view of a third embodiment of the card shaped container of the present invention.

FIG. 20 is a cross-section view taken along lines 6—6 of FIG. 19.

FIG. 21 is a top plan view of the third embodiment of the present invention illustrating the card shaped container with the adaptor and small compact disc carried inside.

FIG. 22 is a cross-section view taken along lines 8—8 of FIG. 21.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is a top plan view of a first embodiment of the small compact disc of the present invention. Disc 100 uses the same technologies, materials, and data standards as does the standard 12 or 8 cm CD, with the only significant exception being that its outside diameter is substantially smaller than a typical prior art 8 or 12 cm compact disc. In the preferred embodiment, the disc is approximately 5.5 to 6.35 cm in diameter.

FIG. 2 is a cross-section taken along lines 2—2 of FIG. 1, illustrating a cross-sectional view of disc 100.

FIG. 3 is a top plan view of an adaptor of the first embodiment of the present invention. Adaptor 300 may be substantially "C"-shaped having an outer diameter of approximately 8 cm. Adaptor 300 may be provided with lands 320 which may be adapted to receive the disc 100 when it is placed upon lands 320. Adaptor 300 may also be provided with a ridge 310, the function of which will be described below.

Note that adaptor 300, although adapted to approximately 8 cm disc circle, maintains an overall form factor of approximately 8 cm by 6 cm, allowing it to be packaged in a credit card, business card, or collectible card type packaging. Note that in the case of a business card embodiment, a slightly larger than normal business card size may be required in order to provide sufficient width for data tracks beyond the width of the center hole.

FIG. 4 is a cross-section of adaptor 300 taken along lines 4—4 of FIG. 3. In use, disc 100 may be placed upon lands 320 and the entire combination of adaptor 300 and disc 100 placed into a CD-ROM drive. Adaptor 300 will rest in the depression of the CD-ROM drive designed for an 8 cm disc. Note that disc 100 merely rests upon lands 320 and lands 320 do not in any way necessarily engage or grip disc 100.

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Once the tray of the CD-ROM drive is closed, the spindle will pick up disc 100 from its resting surface on lands 320. Adaptor 300 will remain in the depression formed in the CD-ROM drive after disc 100 has been picked up and engaged by the CD-ROM drive.

When the tray to the CD-ROM drive is opened, the spindle of the CD-ROM drive will lower disc 100 back onto adaptor 300 and the drive door will open. Without the use of adaptor 300, the disc may fall through the center portion of the drive or become jammed.

FIG. 5 is a top plan view of a first embodiment of the present invention of the card shaped container 500. Card shaped container 500 may be suitably formed from transparent plastic or the like to allow a user to view the contents including any materials imprinted on disc 100. Alternately, card shaped container 500 may be formed from opaque or translucent plastic and/or have indicia printed thereon or printed on labels applied to the card. Card shaped container 500 may have an interior opening 520 along with a slot portion 510 which function will be described below.

FIG. 6 is a cross-section of the card shaped container 500 taken along lines 6—6 of FIG. 5.

FIG. 7 is a top plan view of the first embodiment of the present invention of the card shaped container 500 with adaptor 300 and small compact disc 100 carried inside. FIG. 8 is a cross-section taken along lines 8—8 of FIG. 7. As illustrated in FIGS. 7 and 8, the combination of disc 100 and adaptor 300 may be suitably slid into card shaped container 500. Note that in FIG. 7, the top portion of card shaped container 500 is not shown for purposes of illustration. Ridge 310 slides within slot portion 510 in such a manner as to allow a user to easily slide out adaptor 300 and disc 100 from card shaped container 500.

It should be noted from FIGS. 7 and 8 that, unlike the prior art, the present invention provides a means by which a smaller disc along with an adaptor may be packaged together into a smaller form factor package. Thus, a user need not purchase an additional bulkier adaptor which does not fit into the business card or baseball card form factor. Moreover, the use of a circular disc eliminates any wobble, in balance, and aerodynamic problems present in prior art rectangular discs.

FIG. 9 is a top plan view of a second embodiment of the present invention of a small compact disc 900. Disc 900 may be provided with a nominal diameter of approximately 8 cm, but having substantially parallel portions 910. The distance between substantially parallel portions 910 may be approximately 5.5 to 6.35 cm. Data may be written into that portion of the disc having a diameter less than the distance between substantially parallel portions 910. Although disc 900 is not round (as with disc 100), unlike prior art rectangular discs, disc 900 is smaller with a greater percentage of the edge of the disc being circular and thus making it more aerodynamic, easier to balance, and simpler to align in the depressed portion (8 cm diameter circle) of the compact disc reader tray. Disc 900 may optionally be provided with balancing weights (not shown) in the form of denser or thicker portions which may serve to dynamically balance disc 900.

FIG. 10 is a cross-section taken along lines 10—10 of FIG. 9.

FIG. 11 is a top plan view of a second embodiment of the present invention of the card shaped container. Card shaped container 1100 may be provided with an internal portion 1120. FIG. 12 is a cross-section taken along lines 12—12 of FIG. 11, illustrating the internal portion 1120 of card shaped

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container 1100. Although not illustrated in FIGS. 11 and 12, card shaped container 1100 may be provided with an opening at one end, or in the alternative, the top portion may slide open or may be hinged to open much as in a typical prior art CD-ROM "jewel box" case.

FIG. 13 is a top plan view of a second embodiment of the present invention of the card shaped container with the small compact disc carried inside. As illustrated in FIG. 13, disc 900 may be placed within the internal portion 1120 of card shaped container 1100. Card shaped container 1100 may be provided with an open portion approximately 5.5 to 6.35 cm by 8 cm so as to allow disc 900 to fit therein.

FIG. 14 is a cross-section taken along lines 14—14 of FIG. 13, illustrating a cross-section of the combined apparatus.

FIG. 15 is a top plan view of a third embodiment of the present invention of the small compact disc. Disc 1500 is similar for all intents and purposes as disc 100 of FIG. 1.

FIG. 16 is a cross-section taken along lines 2—2 of FIG. 15.

FIG. 17 is a top plan view of the third embodiment of the present invention illustrating an adaptor. The adaptor of FIG. 17 differs slightly from that of FIG. 3 in that the overall adaptor does not have rounded edges. Rather, raised edges 1710 are provided at a diameter approximately 8 cm across the center of adaptor 1700. Raised edges 1710 may rest inside a depressed portion of a CD-ROM drive designed to accommodate 8 cm discs. Disc 1500 may be carried on adaptor 1700 on lands, such as lands 320 shown in FIG. 3. In the alternative, adaptor 1700 may merely center disc 1500 and thus not actually carry or be in contact with disc 1500.

FIG. 18 is a cross-section taken along lines 4—4 of FIG. 17, illustrating the shape of raised edges 1710.

FIG. 19 is a top plan view of a third embodiment of the present invention of the card shaped container. Card shaped container 1900 may be provided with an internal portion having dimensions 1910 and 1920 being approximately 5.5 to 6.35 cm and 8.5 cm respectively.

FIG. 20 is a cross-section taken along lines 6—6 of FIG. 19.

FIG. 21 is a top plan view of a third embodiment of the present invention illustrating the card shaped container with the adaptor and small compact disc carried inside. As illustrated in FIG. 21, card shaped container 1900 is sized so as to hold both adaptor 1700 and disc 1500 compactly therein. Again, although not illustrated in the Figures, card shaped container 1900 may be provided with an opening top or side portion to allow disc 1500 and adaptor 1700 to slide out or be removed.

FIG. 22 is a cross-section view taken along lines 8—8 of FIG. 21.

While the preferred embodiment and various alternative embodiments of the invention have been disclosed and described in detail herein, it may be apparent to those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope thereof.

I claim:

1. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded non-round compact disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, wherein said optically encoded compact disc has a

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non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate sides spaced apart by the major diameter sufficient to span a corresponding 8 centimeter depressed portion in a compact disc reader tray so as to support and align the optically encoded compact disc in a compact disc reader.

2. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded non-round optically encoded disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, wherein said optically encoded disc has a non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate sides spaced apart by the major diameter sufficient to span a corresponding 8 centimeter depressed portion in a optically encoded disc reader tray so as to support and align the optically encoded disc in an optically encoded disc reader.

3. An optically encoded non-round optically encoded disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, wherein said optically encoded disc has a non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate sides spaced apart by the major diameter sufficient to span a corresponding 8 centimeter depressed portion in a optically encoded disc reader tray so as to support and align the optically encoded disc in an optically encoded disc reader.

4. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus consisting of an optically encoded non-round compact disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, wherein said optically encoded compact disc has a non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate sides spaced apart by the major diameter sufficient to span a corresponding 8 centimeter depressed portion in a compact disc reader tray so as to support and align the optically encoded compact disc in a compact disc reader.

5. An optically encoded non-round disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, said optically encoded disc has a non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate sides spaced apart by the major diameter,

wherein said major diameter is sufficient to span a corresponding 8 centimeter depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader and said arcuate sides provide a balanced and aerodynamic shape to said optically encoded non-round disc so as to reduce vibration and noise when said non-round disc is rotated in the disc reader.

6. An optically encoded planar non-round disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, said optically encoded planar non-round disc having a non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate sides spaced apart by the major diameter, said optically encoded planar non-round disc having upper and lower substantially planar surfaces,

wherein said major diameter is sufficient to span a corresponding 8 centimeter depressed portion in a disc

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reader tray so as to support and align the optically encoded planar non-round disc in a disc reader and said arcuate sides provide a balanced and aerodynamic shape to said optically encoded planar non-round disc so as to reduce vibration and noise when said planar non-round disc is rotated in the disc reader.

7. A combined compact disc and container for use as a business, credit or collectors card, comprising:

a non-round compact disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter of approximately 8 centimeters; and

a rectangular card-shaped container having a minor axial dimension substantially the same as the minor diameter of the compact disc, for receiving and storing the compact disc,

wherein said non-round compact disc has at least two substantially parallel sides spaced apart by the minor diameter to allow the compact disc to be placed in the rectangular card-shaped container, and two arcuate portions spaced apart by the major diameter sufficient

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to span a corresponding 8 centimeter depressed portion in a compact disc reader tray so as to support and align the compact disc in a compact disc reader.

8. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded non-round compact disc having a minor diameter approximately 5.5 to 6.35 centimeters and a major diameter approximately 8 centimeters, wherein said optically encoded compact disc has a non-round shape including two substantially parallel sides spaced apart by the minor diameter and two arcuate portions spaced apart by the major diameter sufficient to span a corresponding 8 centimeter depressed portion in a compact disc reader tray so as to support and align the optically encoded compact disc in a compact disc reader.

* * * * *

EXHIBIT C



(12) **United States Patent**
Wood

(10) Patent No.: US 6,762,988 B2
(45) Date of Patent: *Jul. 13, 2004

(54) CD CARD

(76) Inventor: David B. Wood, 14027 Betsy Ross La., Centreville, VA (US) 20121

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 32 days.

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This patent is subject to a terminal disclaimer.

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(65) Prior Publication Data

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Related U.S. Application Data

(63) Continuation of application No. 09/170,040, filed on Oct. 13, 1998

(60) Provisional application No. 60/062,408, filed on Oct. 14, 1997.

(51) Int. Cl. 7 G11B 3/70

(52) U.S. Cl. 369/273

(58) Field of Search 369/273, 289

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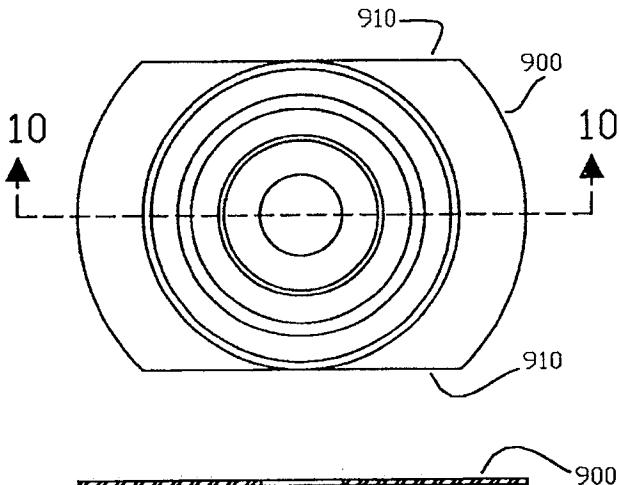
Primary Examiner—David Davis

(74) Attorney, Agent, or Firm—Robert Platt Bell

(57) ABSTRACT

A CD Card for packaging card like information and digital information in the basic dimensions (length and width) of a business, credit or collectors card. The CD Card is made up of one, two, or three major components. The first component is a small compact disc with dimensions small enough to be contained within the typical dimensions (length and width) of a business card, credit card, or collectors card. The second component is a container shaped like a business, credit, or collectors card in length and width, but with a depth large enough to hold the small compact disc and adaptor (if required) discussed subsequently. The third component is an adaptor designed to position the small compact disc of the first and third embodiments of the present invention correctly in standard CD drives. A second embodiment of the small compact disc may not require an adaptor or case. The adaptor also has dimensions small enough to be contained within the typical dimensions (length and width) of a business card, credit card, or collectors card.

14 Claims, 6 Drawing Sheets



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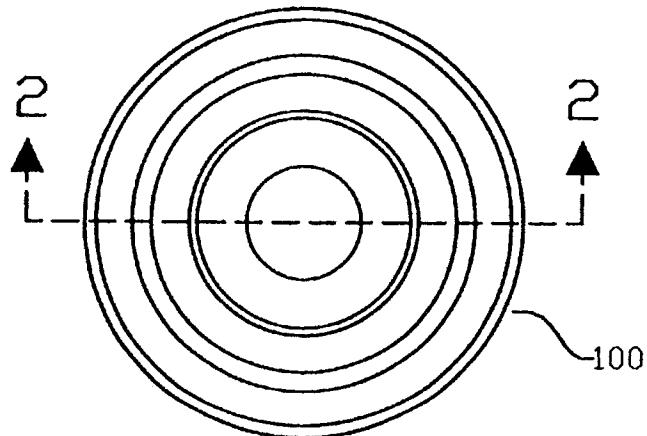


Figure 1



Figure 2

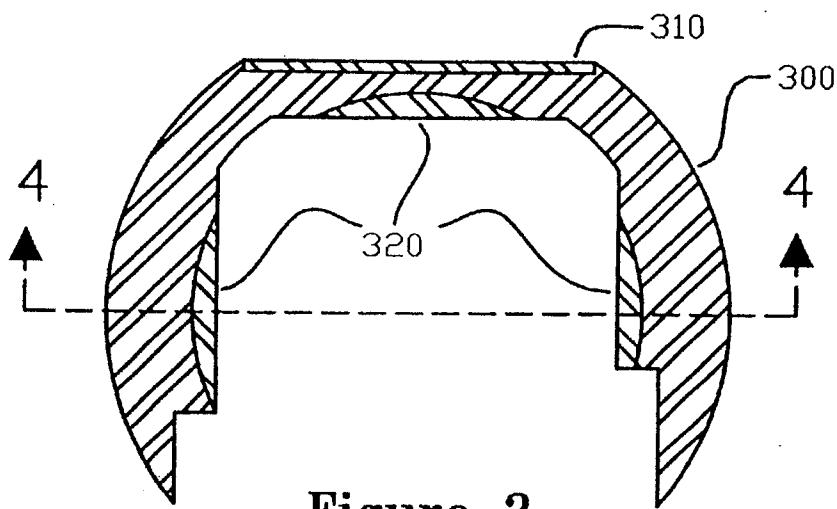


Figure 3



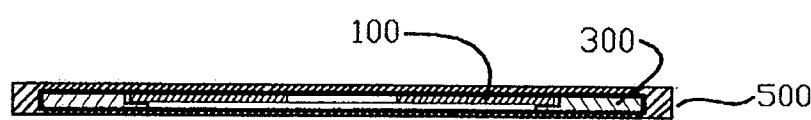
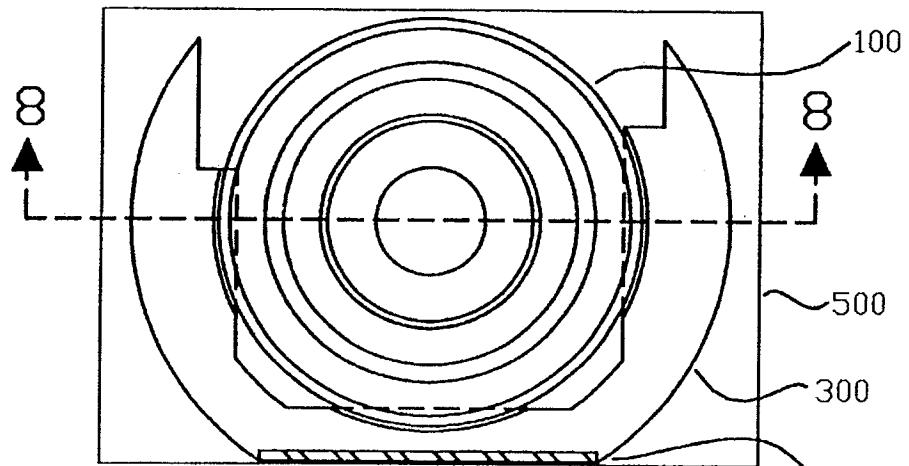
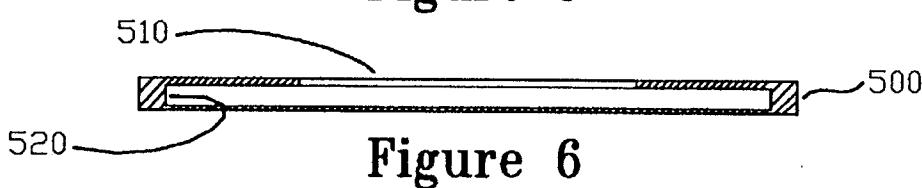
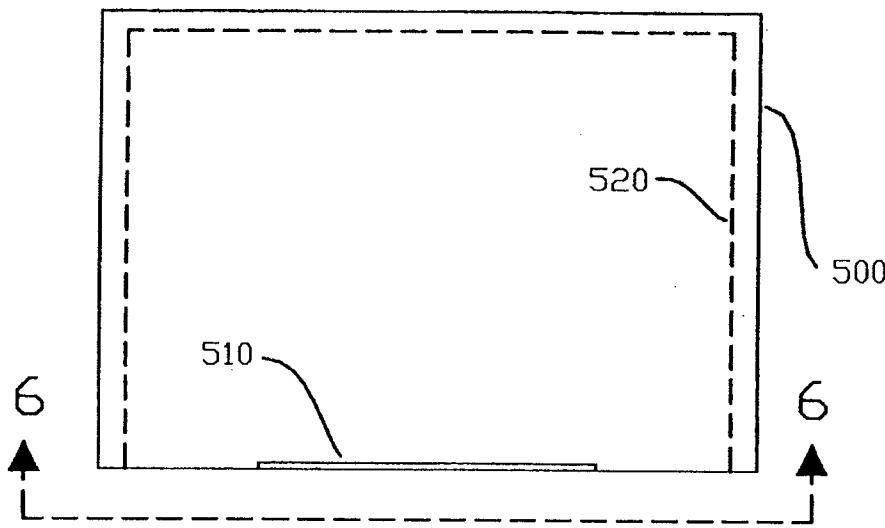
Figure 4

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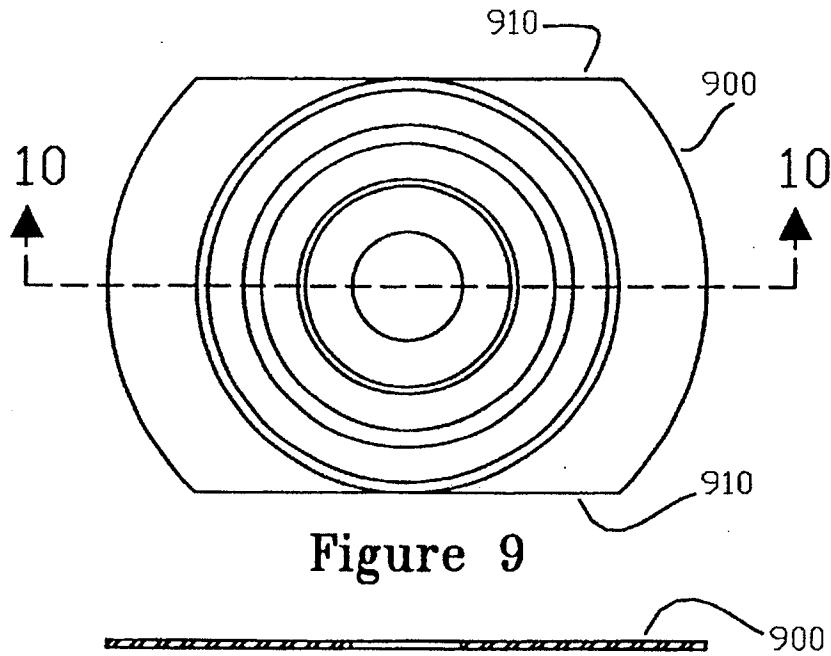
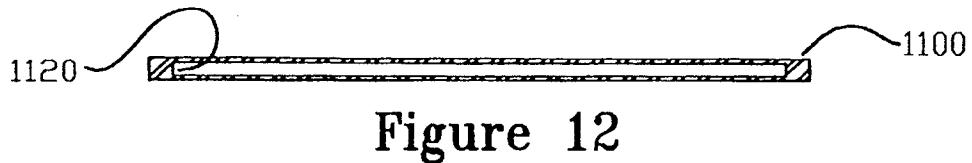
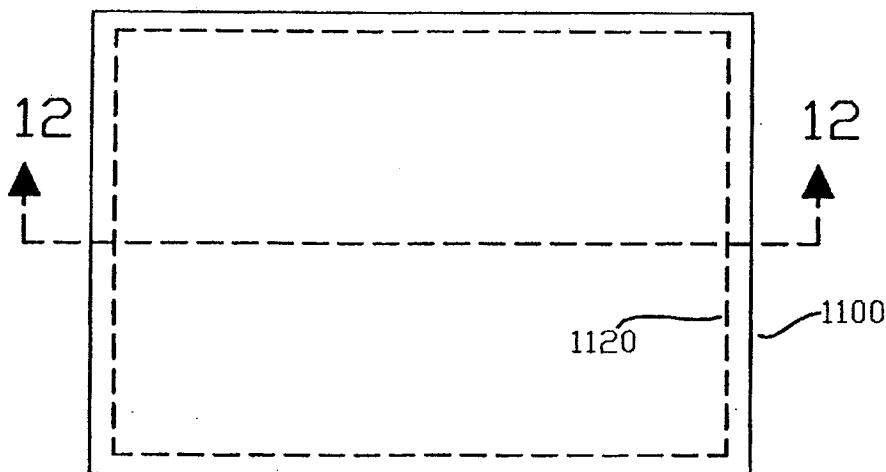


Figure 10



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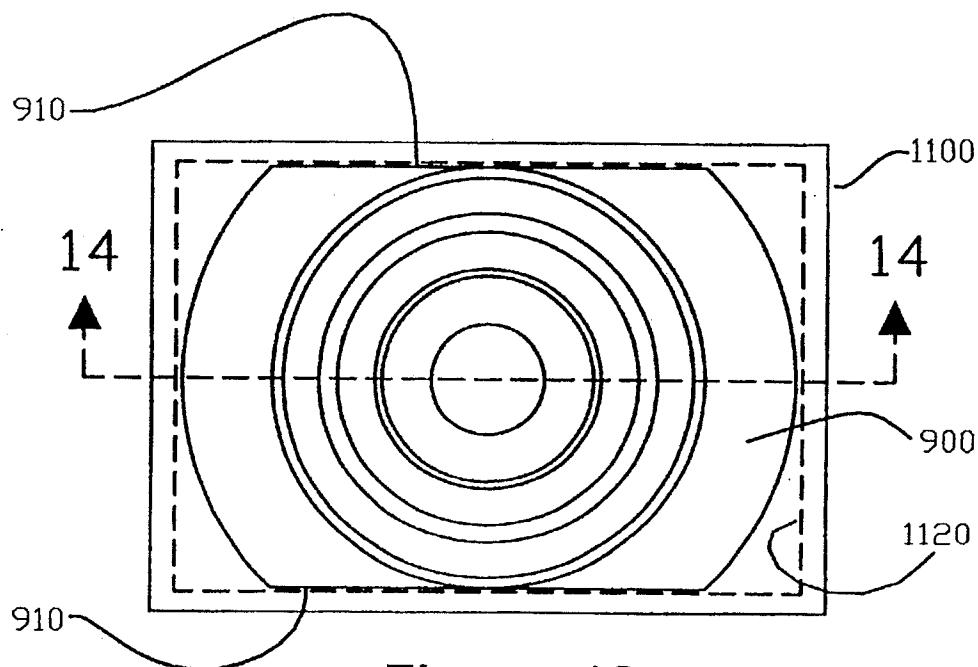


Figure 13

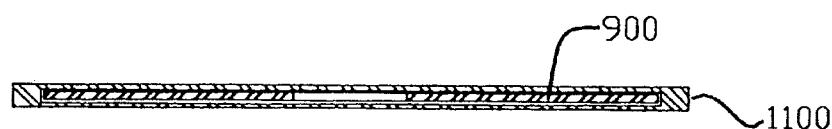


Figure 14

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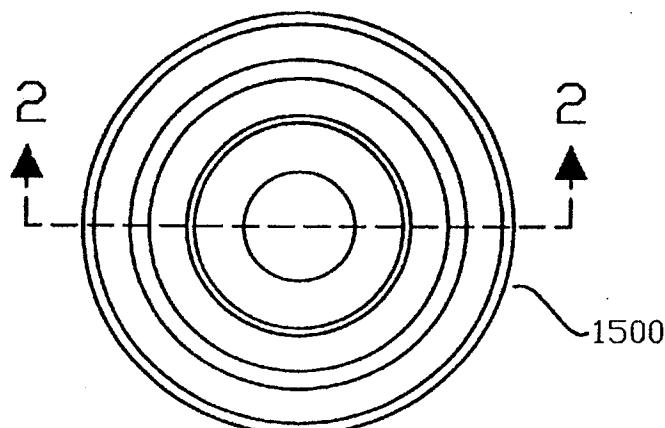


Figure 15



Figure 16

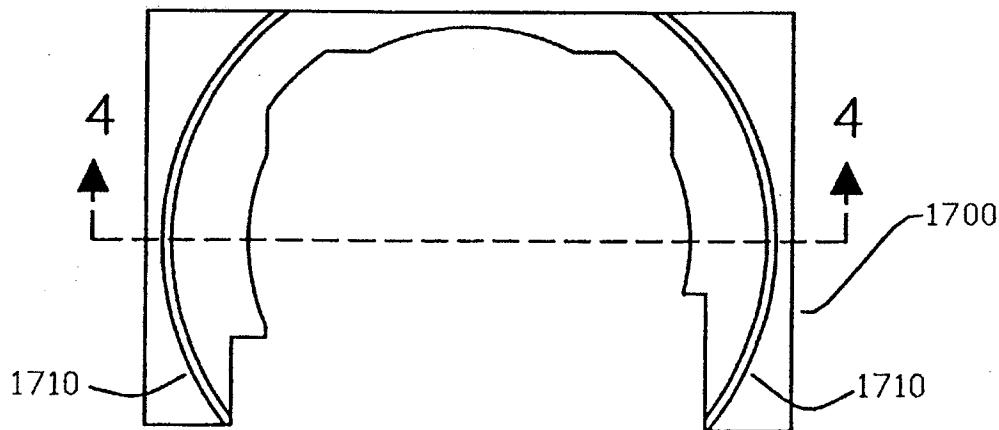


Figure 17



Figure 18

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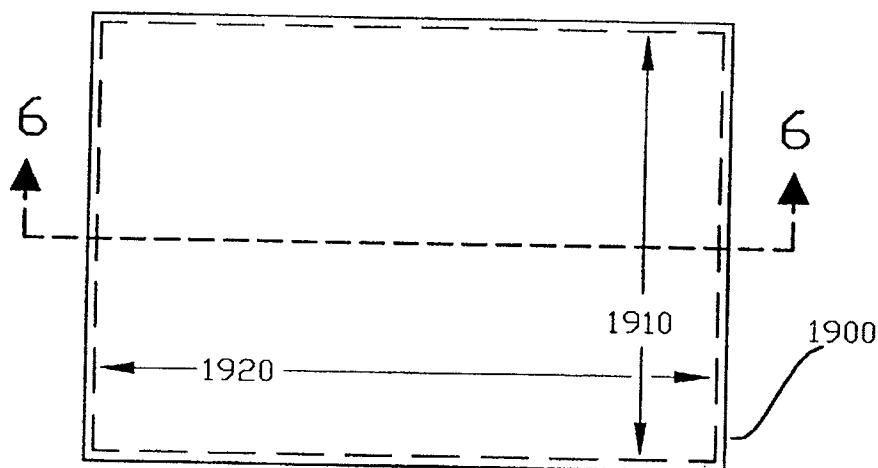


Figure 19



Figure 20

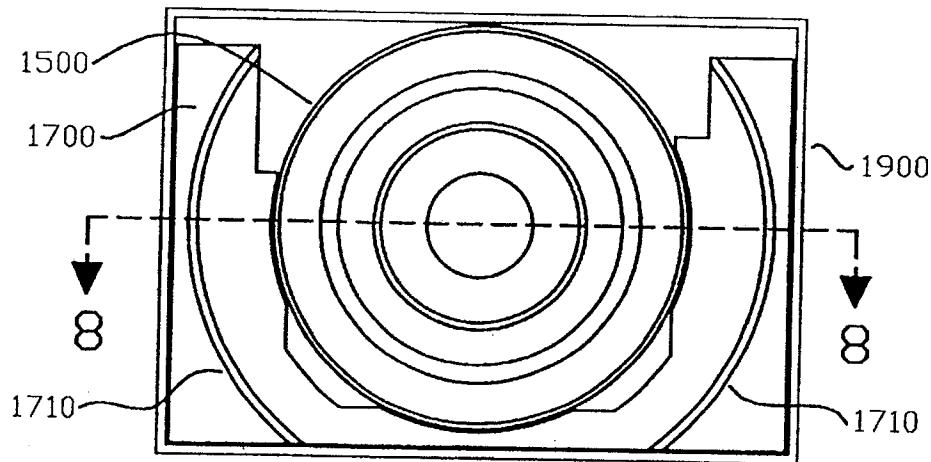


Figure 21

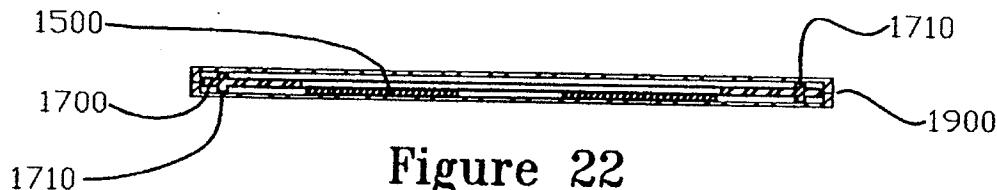


Figure 22

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CD CARD**CROSS-REFERENCE TO RELATED APPLICATIONS**

The present application is a Continuation of U.S. patent application Ser. No. 09/170,040 filed on Oct. 13, 1998, and incorporated herein by reference.

This application also claims priority from Provisional U.S. Application Ser. No. 60/062,408, filed Oct. 14, 1997, which is incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to the field of compact disc (CD) data storage, specifically to a method and apparatus for packaging a smaller size compact disc, or a smaller size compact disc and disc adaptor into a credit card, business card, or baseball card/collectors card size.

BACKGROUND OF THE INVENTION

It may be desirable to be able to distribute digital information in a medium as widely accepted and easily carried as a business, credit, or collectors card that can be read or read and written to by a standard CD drive. For example, Spector, U.S. Pat. No. 5,090,561 discusses using a CD-ROM as a baseball collectable (Col. 2, lines 3-10) and provides a case for displaying such collectibles. However, a standard 12 cm CD-ROM is rather large and awkward compared to a standard baseball card, business card, or credit card size format.

It also may be desirable to change the shape of the small compact disc of the invention. It is known that a standard 12 cm in diameter compact disc can be cut (made) to have straight sides and play as a standard 12 cm diameter CD. Such a product is presently marketed under the trade name CyberTract™ and is commercially available through the American Tract Society and made with the cooperation of DISCART™, LLC, which claims copyright to the disc shapes and also claims patents pending.

One such tract, for example, has been marketed using the likeness of the late Mickey Mantle imprinted onto the face of the device. The device is encoded with text, graphics, and video of the late Mickey Mantle discussing his religious conversion. The overall appearance (but not size) of the device is akin to that of a baseball card or collectable, on one side.

The DISCART™ device, however, is made as a cut down (rectangular) version of a standard 12 cm compact disc (CD). This disc maintains the 12 cm diameter at four points to align itself in the CD drive. As a result, the packaged product is larger than a standard baseball card or sports collectable. Thus, products such as the DISCART™ device may not be as readily acceptable for collectors. Such an apparatus, for example, would not fit within standard baseball card holders, drawers, or shelving.

In addition, while the device appears to play satisfactorily in most CD players and CD-ROM drives, after testing the inventor has discovered that the device may create some vibrations or noise when played or used in some CD players or CD-ROM drives. The rectangular shape of the disc creates a slight imbalance or non-aerodynamic shape which may result in vibration in some CD players.

Another approach is a CD-ROM card marketed as "The CarD" by ADIVAN High Tech AG, Switzerland (www.adivan.com). The inventor is unaware of the first disclosure date of the ADIVAN device, and thus does not

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represent that the device qualifies as "prior art" per se. However, the device is disclosed herein under the spirit of the duty of disclosure.

The ADIVAN device is a CD-ROM provided in a number of shapes and sizes within a specified range. Four "knobs", spaced along a 75 mm diameter circle protrude from the underside of card, to align the card in a CD-ROM drive utilizing the 8 cm depressed portion of the CD-ROM drive tray. The presence of protruding knobs may make the card less useful as a business card device, as the resultant card is no longer flat. As such, storage devices for business cards, baseball cards, and the like, may not readily accept such a card. The knobs also make the card less aerodynamic and cause greater vibration. It would also appear to require a special mold to form the knobs.

One approach to solving such problems might be to use the 8 cm CD of the prior art. It is known that an 8 cm in diameter compact disc made by the Sony Corporation is commercially available. The 8 cm compact disc holds the same type of information that the 12 cm diameter disc can and is playable in standard CD drives. Such CD "singles" have heretofore been used mainly for music applications and the like. However, even an 8 cm CD is too large to fit in a standard baseball or business card size format.

Various adapters are known in the art for attaching to a 8 cm CD to adapt the 8 cm CD for playback on a 12 cm CD player, much as the old spindle adapters were used to play 45 RPM records on LP turntables. These adapters were designed when CD players did not incorporate an 8 cm aligning circle as they do today. Such adapters were also designed for use in compact disc cartridges (Caddys) which are very rare today. These adapters are still helpful today in playing 8 cm CDs in multi-disc cartridges and front loading players. 90 to 95% of CD players used today are tray loading drive types with 8 cm aligning circles, making these adapters unnecessary in the majority of CD players.

Yamamori, U.S. Pat. No. 4,837,784, issued Jun. 6, 1989, discloses one such device. It should be noted that it appears that the device of Yamamori engages the smaller 8 cm disc, thus forming a package which is 12 cm in diameter. Although the device of Yamamori may be suitable for playing back 8 cm discs, the overall structure of the apparatus suffers from some drawbacks.

To begin with, the adaptor has a 12 cm outer diameter. Thus, if the adaptor is distributed with an 8 cm disc, the overall package size would need to be at least 12 cm in diameter, or that of a standard CD case (e.g., so-called "jewel box"). It also requires excess handling of the 8 cm disc and the possibility of disengagement of the adaptor from the disc resulting in damage to the disc or the disc drive.

Eihaus, U.S. Pat. No. 4,889,330, issued Feb. 6, 1990, Published EP application 0,331,389, published Sep. 6, 1989, and EP Patent Specification 0,391,638 published Apr. 19, 1995, all disclose similar CD adapters for adapting an 8 cm CD to a 12 cm format. However, all of those devices appear to suffer from the same fundamental limitations of the Yamamori device. In particular, the overall size of such adapters precludes them from being packaged into a package substantially smaller than a standard 12 cm CD-ROM. Moreover, such devices appear to physically attach to the CD-ROM itself.

Yamashita et al., U.S. Pat. No. 5,457,677, issued Oct. 10, 1995, discloses an adaptor for a smaller CD for use in a multi-CD adaptor. The device grips the smaller CD which is then removed from the adaptor laterally by the playback

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apparatus. Such a device may not be readily adaptable to a tray-type CD-ROM player or the like.

Typical CD-ROM drives with opening trays may be provided with a depressed inner portion which may be used to center an 8 cm CD-ROM. Once the CD-ROM is placed in this depression, and the tray closed, the spindle of the CD-ROM drive may engage the center hole of an 8 cm CD-ROM successfully and the 8 cm CD-ROM may be read. Without such a depression, the 8 cm CD-ROM may slide about when the tray is closed, and the spindle may not properly engage, possibly damaging or scratching the 8 cm CD-ROM.

While such a solution may work for an 8 cm CD-ROM, it may not work for other, odd sizes. Given the large installed base of CD-ROM drives, one wishing to distribute a non-standard (e.g., diameter other than 8 cm or 12 cm) CD-ROM size, one cannot expect users to buy new CD-ROM drives with yet a second depression for yet another size CD-ROM.

SUMMARY OF THE INVENTION

In a first embodiment, the present invention may utilize a small compact disc, smaller than the standard 12 cm diameter CD, that will fit inside a card shaped container (if desired). In accordance with the invention, a CD Card device for packaging digital information in a medium as widely accepted and easily carried as a business, credit or collectors card that can be read (or read and written to by drives and disc types so capable) by standard CD drives comprises a small compact disc. This small compact disc is smaller than the standard 12 cm in diameter compact disc commonly used today and the 8 cm compact disc referred to in the Background of the Invention Section above.

The small compact disc of the present invention uses the same technology (materials, and data standards) as does the standard 12 cm diameter CD with the only significant exception being its outside diameter (in a first and third embodiments) or its shape (in a second embodiment). Also, weight may be added to the small compact disc of either embodiment by adding heavier materials and/or increasing the thickness of some outer areas.

The small CD of the present invention may store any data that is stored on a standard 12 cm compact disc, and be read or read and written to if so designed, like any standard 12 cm disc so capable. This is possible because all critical information to allow the proper use of a CD is carried in the innermost part of the area that carries information. Such information falls within the diameter of the small compact disc of the invention. The small compact disc of the invention requires only proper placement in the standard CD drive to perform properly.

The first and third embodiments of the present invention may require an adaptor to ensure proper placement. This adaptor is discussed in the following paragraph. The second (and preferred) embodiment of the invention may not require an adaptor to assure proper placement. Both small compact discs, one embodiment of which may be approximately 5.5 to 6.35 cm in diameter in the case of the first and third embodiments and the other having an approximate width of 5.5 to 6.35 cm and a length of 8 cm in the case of the second (and preferred) embodiment, will have less storage capacity than the standard 12 cm in diameter compact disc.

An adaptor is designed for use with the first and third embodiments of the present invention. The adaptor is designed to position the small compact disc of the first and third embodiments correctly so that it will be accepted by the

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CD drive. The adaptor is also stored within the card shaped container. One embodiment of the adaptor may stretch across (over) the 8 cm disc aligning circle (available with tray loading CD drives), being kept in position by protruding arc shaped ridges. In this position it will align the small compact disc for proper use.

First, the adaptor is placed in the CD drive tray, then the small compact disc is placed within it. The adaptor will remain in its initial position in the tray as the small compact disc is lifted out of it by the drive mechanism for use. The small compact disc will be returned to the adaptor by the drive mechanism when the small compact disc is no longer in use.

The small compact disc of the second embodiment (and preferred) of the present invention, when placed in the tray, will be in the proper position as a result of its shape.

A card shaped container may hold the small compact disc in a manner to protect it from the casual handling that is common to business, credit and collector cards, the type of handling that could damage a compact disc. It also may hold the adaptor (in the first and third embodiments) used to position the small compact disc. The container permits removal and replacement of the small compact disc (and the adaptor, in the first and third embodiments) from within the card. The card may be designed to display information similar to a credit, business or collectors card on its surfaces.

In its preferred embodiment the CD card may be offered as a digital collectors card, for example a baseball, football, or basketball card. It may also be offered as a digital card displaying the common sights at vacation areas to remind vacationers of their trip while using their computer. One way in which the information may be displayed is in the format of a screen saver. The card may also be used as would a conventional business card but with the added dimension of conveying large amounts of digital information to its recipient. There are many possible uses for the CD Card only some of which are described here.

It is known that in a small percentage of CD drives (less than 5%) a larger adaptor for the first and third embodiments or a newly designed adaptor for the second embodiment may be needed. If it is desired that the smaller compact discs be read in those CD drives, a special larger adaptor may be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily carried into effect, it will now be described with the accompanying drawings wherein:

FIG. 1 is a top plan view of a first embodiment of the small compact disc of the present invention.

FIG. 2 is a cross-section view taken along lines 2—2 of FIG. 1.

FIG. 3 is a top plan view of a first embodiment of the adaptor of the present invention.

FIG. 4 is a cross-section view taken along lines 4—4 of FIG. 3.

FIG. 5 is a top plan view of a first embodiment of the card shaped container of the present invention.

FIG. 6 is a cross-section view taken along lines 6—6 of FIG. 5.

FIG. 7 is a top plan view of the first embodiment of the present invention of the card shaped container with the adaptor and small compact disc carried inside.

FIG. 8 is a cross-section view taken along lines 8—8 of FIG. 7.

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FIG. 9 is a top plan view of a second (and preferred) embodiment of the small compact disc of the present invention.

FIG. 10 is a cross-section view taken along lines 10—10 of FIG. 9.

FIG. 11 is a top plan view of a second embodiment of the card shaped container of the present invention.

FIG. 12 is a cross-section view taken along lines 12—12 of FIG. 11.

FIG. 13 is a top plan view of a second embodiment of the present invention of the card shaped container with the small compact disc carried inside.

FIG. 14 is a cross-section view taken along lines 14—14 of FIG. 13.

FIG. 15 is a top plan view of a third embodiment of the small compact disc of the present invention.

FIG. 16 is a cross-section view taken along lines 2—2 of FIG. 15.

FIG. 17 is a top plan view of a third embodiment of the present invention illustrating an adaptor.

FIG. 18 is a cross-section view taken along lines 4—4 of FIG. 17.

FIG. 19 is a top plan view of a third embodiment of the card shaped container of the present invention.

FIG. 20 is a cross-section view taken along lines 6—6 of FIG. 19.

FIG. 21 is a top plan view of the third embodiment of the present invention illustrating the card shaped container with the adaptor and small compact disc carried inside.

FIG. 22 is a cross-section view taken along lines 8—8 of FIG. 21.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is a top plan view of a first embodiment of the small compact disc of the present invention. Disc 100 uses the same technologies, materials, and data standards as does the standard 12 or 8 cm CD, with the only significant exception being that its outside diameter is substantially smaller than a typical prior art 8 or 12 cm compact disc. In the preferred embodiment, the disc is approximately 5.5 to 6.35 cm in diameter.

FIG. 2 is a cross-section taken along lines 2—2 of FIG. 1, illustrating a cross-sectional view of disc 100.

FIG. 3 is a top plan view of an adaptor of the first embodiment of the present invention. Adaptor 300 may be substantially "C"-shaped having an outer diameter of approximately 8 cm. Adaptor 300 may be provided with lands 320 which may be adapted to receive the disc 100 when it is placed upon lands 320. Adaptor 300 may also be provided with a ridge 310, the function of which will be described below.

Note that adaptor 300, although adapted to approximately 8 cm disc circle, maintains an overall form factor of approximately 8 cm by 6 cm, allowing it to be packaged in a credit card, business card, or collectible card type packaging. Note that in the case of a business card embodiment, a slightly larger than normal business card size may be required in order to provide sufficient width for data tracks beyond the width of the center hole.

FIG. 4 is a cross-section of adaptor 300 taken along lines 4—4 of FIG. 3. In use, disc 100 may be placed upon lands 320 and the entire combination of adaptor 300 and disc 100 placed into a CD-ROM drive. Adaptor 300 will rest in the

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depression of the CD-ROM drive designed for an 8 cm disc. Note that disc 100 merely rests upon lands 320 and lands 320 do not in any way necessarily engage or grip disc 100. Once the tray of the CD-ROM drive is closed, the spindle will pick up disc 100 from its resting surface on lands 320. Adaptor 300 will remain in the depression formed in the CD-ROM drive after disc 100 has been picked up and engaged by the CD-ROM drive.

When the tray to the CD-ROM drive is opened, the spindle of the CD-ROM drive will lower disc 100 back onto adaptor 300 and the drive door will open. Without the use of adaptor 300, the disc may fall through the center portion of the drive or become jammed.

FIG. 5 is a top plan view of a first embodiment of the present invention of the card shaped container 500. Card shaped container 500 may be suitably formed from transparent plastic or the like to allow a user to view the contents including any materials imprinted on disc 100. Alternately, card shaped container 500 may be formed from opaque or translucent plastic and/or have indicia printed thereon or printed on labels applied to the card. Card shaped container 500 may have an interior opening 520 along with a slot portion 510 which function will be described below.

FIG. 6 is a cross-section of the card shaped container 500 taken along lines 6—6 of FIG. 5.

FIG. 7 is a top plan view of the first embodiment of the present invention of the card shaped container 500 with adaptor 300 and small compact disc 100 carried inside. FIG. 8 is a cross-section taken along lines 8—8 of FIG. 7. As illustrated in FIGS. 7 and 8, the combination of disc 100 and adaptor 300 may be suitably slid into card shaped container 500. Note that in FIG. 7, the top portion of card shaped container 500 is not shown for purposes of illustration. Ridge 310 slides within slot portion 510 in such a manner as to allow a user to easily slide out adaptor 300 and disc 100 from card shaped container 500.

It should be noted from FIGS. 7 and 8 that, unlike the prior art, the present invention provides a means by which a smaller disc along with an adaptor may be packaged together into a smaller form factor package. Thus, a user need not purchase an additional bulkier adaptor which does not fit into the business card or baseball card form factor. Moreover, the use of a circular disc eliminates any wobble, imbalance, and aerodynamic problems present in prior art rectangular discs.

FIG. 9 is a top plan view of a second embodiment of the present invention of a small compact disc 900. Disc 900 may be provided with a nominal diameter of approximately 8 cm, but having substantially parallel portions 910. The distance between substantially parallel portions 910 may be approximately 5.5 to 6.35 cm. Data may be written into that portion of the disc having a diameter less than the distance between substantially parallel portions 910. Although disc 900 is not round (as with disc 100), unlike prior art rectangular discs, disc 900 is smaller with a greater percentage of the edge of the disc being circular and thus making it more aerodynamic, easier to balance, and simpler to align in the depressed portion (8 cm diameter circle) of the compact disc reader tray. Disc 900 may optionally be provided with balancing weights (not shown) in the form of denser or thicker portions which may serve to dynamically balance disc 900.

FIG. 10 is a cross-section taken along lines 10—10 of FIG. 9.

FIG. 11 is a top plan view of a second embodiment of the present invention of the card shaped container. Card shaped

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container 1100 may be provided with an internal portion 1120. FIG. 12 is a cross-section taken along lines 12—12 of FIG. 11, illustrating the internal portion 1120 of card shaped container 1100. Although not illustrated in FIGS. 11 and 12, card shaped container 1100 may be provided with an opening at one end, or in the alternative, the top portion may slide open or may be hinged to open much as in a typical prior art CD-ROM "jewel box" case.

FIG. 13 is a top plan view of a second embodiment of the present invention of the card shaped container with the small compact disc carried inside. As illustrated in FIG. 13, disc 900 may be placed within the internal portion 1120 of card shaped container 1100. Card shaped container 1100 may be provided with an open portion approximately 5.5 to 6.35 cm by 8 cm so as to allow disc 900 to fit therein.

FIG. 14 is a cross-section taken along lines 14—14 of FIG. 13, illustrating a cross-section of the combined apparatus.

FIG. 15 is a top plan view of a third embodiment of the present invention of the small compact disc. Disc 1500 is similar for all intents and purposes as disc 100 of FIG. 1.

FIG. 16 is a cross-section taken along lines 2—2 of FIG. 15.

FIG. 17 is a top plan view of the third embodiment of the present invention illustrating an adaptor. The adaptor of FIG. 17 differs slightly from that of FIG. 3 in that the overall adaptor does not have rounded edges. Rather, raised edges 1710 are provided at a diameter approximately 8 cm across the center of adaptor 1700. Raised edges 1710 may rest inside a depressed portion of a CD-ROM drive designed to accommodate 8 cm discs. Disc 1500 may be carried on adaptor 1700 on lands, such as lands 320 shown in FIG. 3. In the alternative, adaptor 1700 may merely center disc 1500 and thus not actually carry or be in contact with disc 1500.

FIG. 18 is a cross-section taken along lines 4—4 of FIG. 17, illustrating the shape of raised edges 1710.

FIG. 19 is a top plan view of a third embodiment of the present invention of the card shaped container. Card shaped container 1900 may be provided with an internal portion having dimensions 1910 and 1920 being approximately 5.5 to 6.35 cm and 8.5 cm respectively.

FIG. 20 is a cross-section taken along lines 6—6 of FIG. 19.

FIG. 21 is a top plan view of a third embodiment of the present invention illustrating the card shaped container with the adaptor and small compact disc carried inside. As illustrated in FIG. 21, card shaped container 1900 is sized so as to hold both adaptor 1700 and disc 1500 compactly therein. Again, although not illustrated in the Figures, card shaped container 1900 may be provided with an opening top or side portion to allow disc 1500 and adaptor 1700 to slide out or be removed.

FIG. 22 is a cross-section view taken along lines 8—8 of FIG. 21.

While the preferred embodiment and various alternative embodiments of the invention have been disclosed and described in detail herein, it may be apparent to those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope thereof.

I claim:

1. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded non-rectangular disc having a diameter between substantially 8 centimeters and less than

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12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel sides and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

2. The data storage apparatus of claim 1, wherein the at least two parallel sides are spaced approximately 5.5 to 6.35 centimeters from one another.

3. The data storage apparatus of claim 2, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

4. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded disc having a diameter between substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel sides and at least two arcuate portions and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

5. The data storage apparatus of claim 4, wherein the at least two parallel sides are spaced approximately 5.5 to 6.35 centimeters from one another.

6. The data storage apparatus of claim 5, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

7. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded disc having a diameter between substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded disc has a non-round shape including at least two arcuate portions and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader,

further including at least two parallel sides are spaced approximately 5.5 to 6.35 centimeters from one another.

8. The data storage apparatus of claim 7, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

9. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded non-rectangular disc having a diameter between substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel sides and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

10. The data storage apparatus of claim 9, wherein the at least two parallel sides are spaced approximately 5.5 to 6.35 centimeters from one another.

11. The data storage apparatus of claim 9, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

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12. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded disc having a diameter between substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel sides and at least two arcuate portions and a diameter along a major axis sufficient to span a corre-

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sponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

13. The data storage apparatus of claim 12, wherein the at least two parallel sides are spaced approximately 5.5 to 6.35 centimeters from one another.

14. The data storage apparatus of claim 13, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

* * * * *

EXHIBIT D



US007308696B2

(12) **United States Patent**
Wood(10) **Patent No.:** US 7,308,696 B2
(45) **Date of Patent:** *Dec. 11, 2007(54) **DATA STORAGE APPARATUS**(75) Inventor: **David B. Wood**, Centreville, VA (US)(73) Assignee: **Serious IP, Inc.**, New York, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **11/484,012**(22) Filed: **Jul. 10, 2006**(65) **Prior Publication Data**

US 2007/0086277 A1 Apr. 19, 2007

Related U.S. Application Data

(63) Continuation of application No. 10/775,556, filed on Feb. 11, 2004, now Pat. No. 7,100,180, which is a continuation of application No. 10/106,857, filed on Mar. 27, 2002, now Pat. No. 6,762,988, which is a continuation of application No. 09/170,040, filed on Oct. 13, 1998, now Pat. No. 6,510,124.

(60) Provisional application No. 60/062,408, filed on Oct. 14, 1997.

(51) **Int. Cl.****GIIB 7/24** (2006.01)(52) **U.S. Cl.** **720/720**(58) **Field of Classification Search** **720/720; 369/273**

See application file for complete search history.

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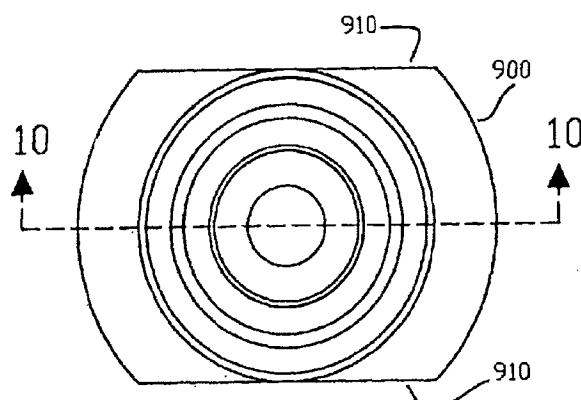
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(Continued)

Primary Examiner—David Davis(57) **ABSTRACT**

A CD Card for packaging card like information and digital information in the basic dimensions (length and width) of a business, credit or collectors card. The CD Card is made up of one, two, or three major components. The first component is a small compact disc with dimensions small enough to be contained within the typical dimensions (length and width) of a business card, credit card, or collectors card. The second component is a container shaped like a business, credit, or collectors card in length and width, but with a depth large enough to hold the small compact disc and adapter (if required) discussed subsequently. The third component is an adapter designed to position the small compact disc of the first and third embodiments of the present invention correctly in standard CD drives. A second embodiment of the small compact disc may not require an adapter or case. The adapter also has dimensions small enough to be contained within the typical dimensions (length and width) of a business card, credit card, or collectors card.

20 Claims, 6 Drawing Sheets

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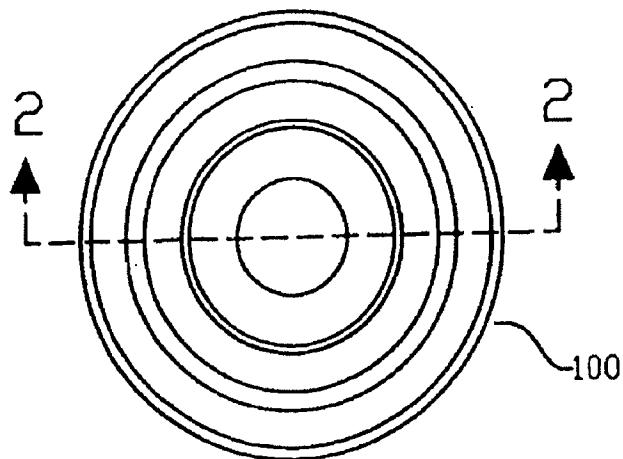


Figure 1



Figure 2

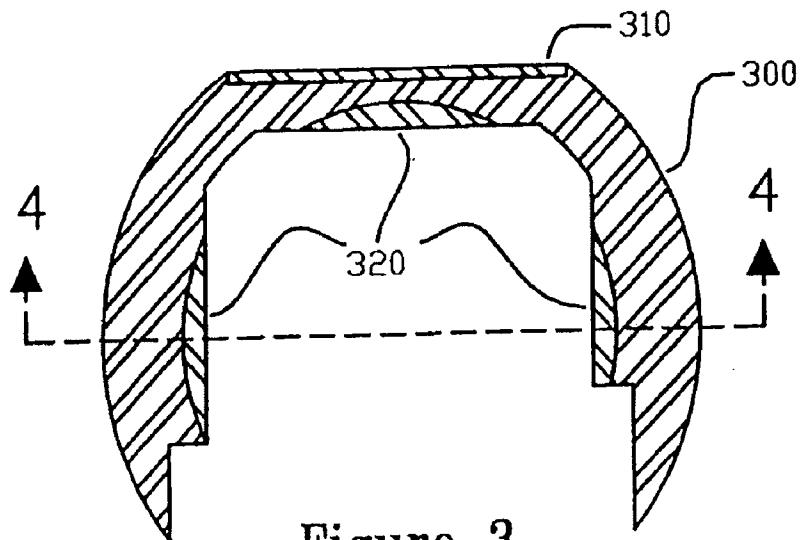


Figure 3

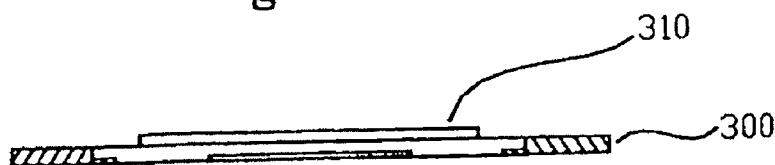


Figure 4

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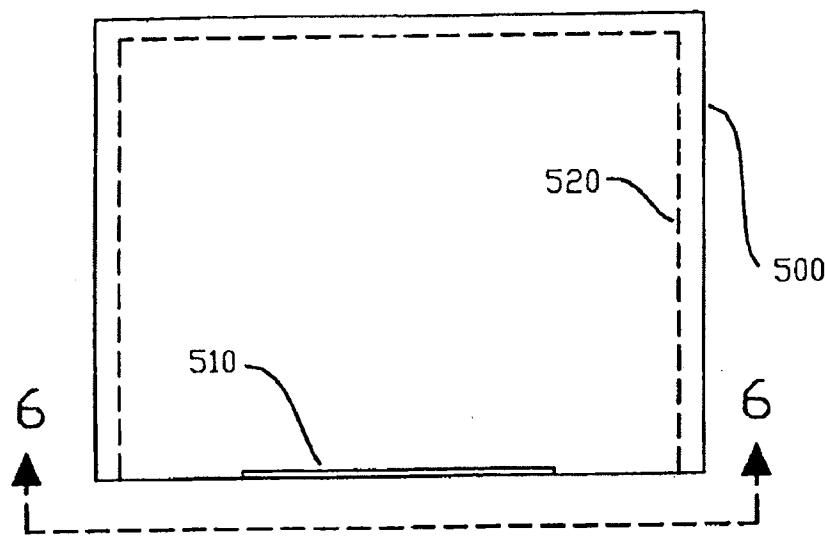


Figure 5

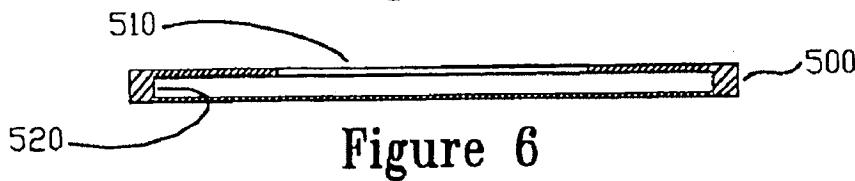


Figure 6

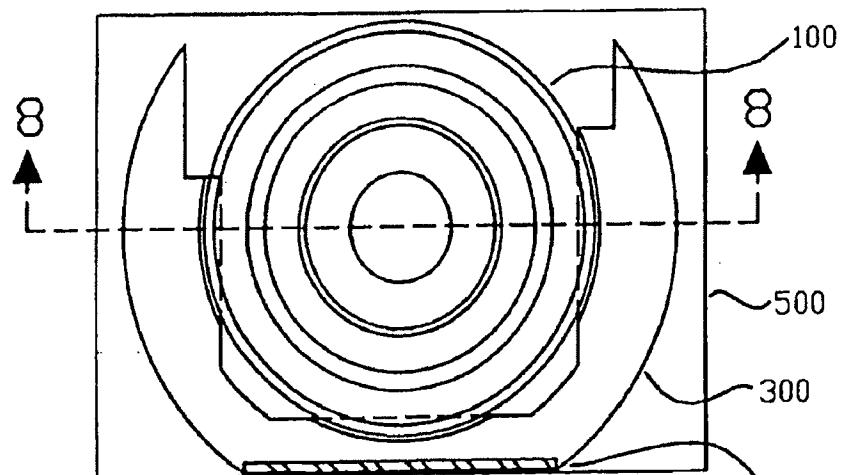


Figure 7

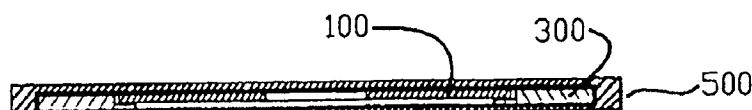


Figure 8

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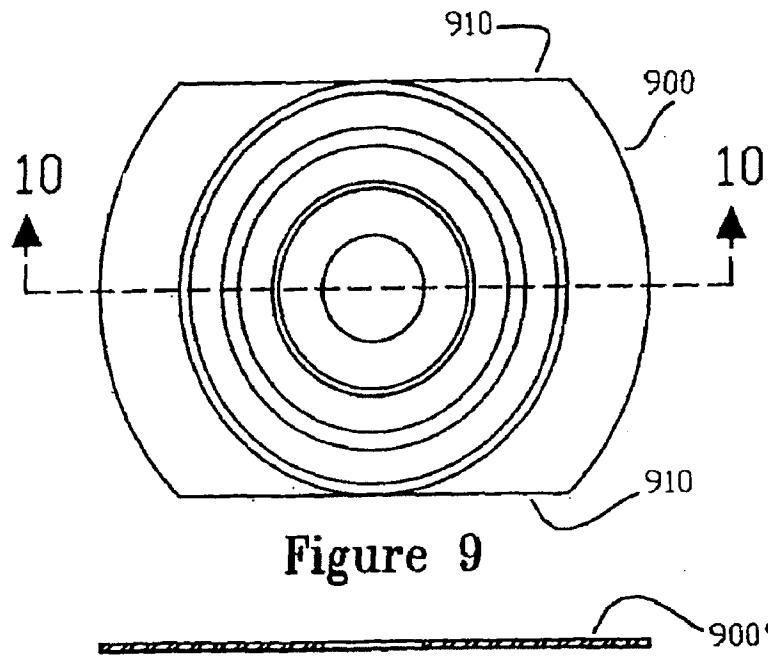


Figure 9



Figure 10

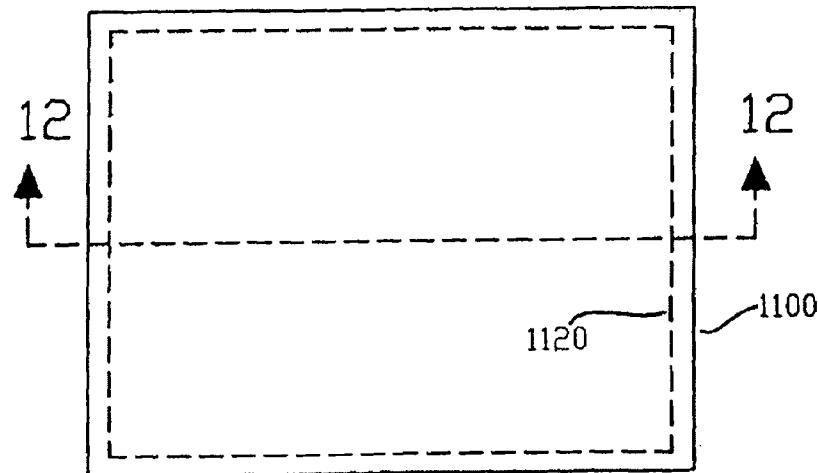


Figure 11

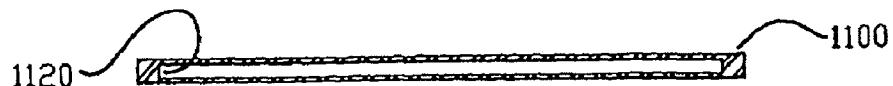


Figure 12

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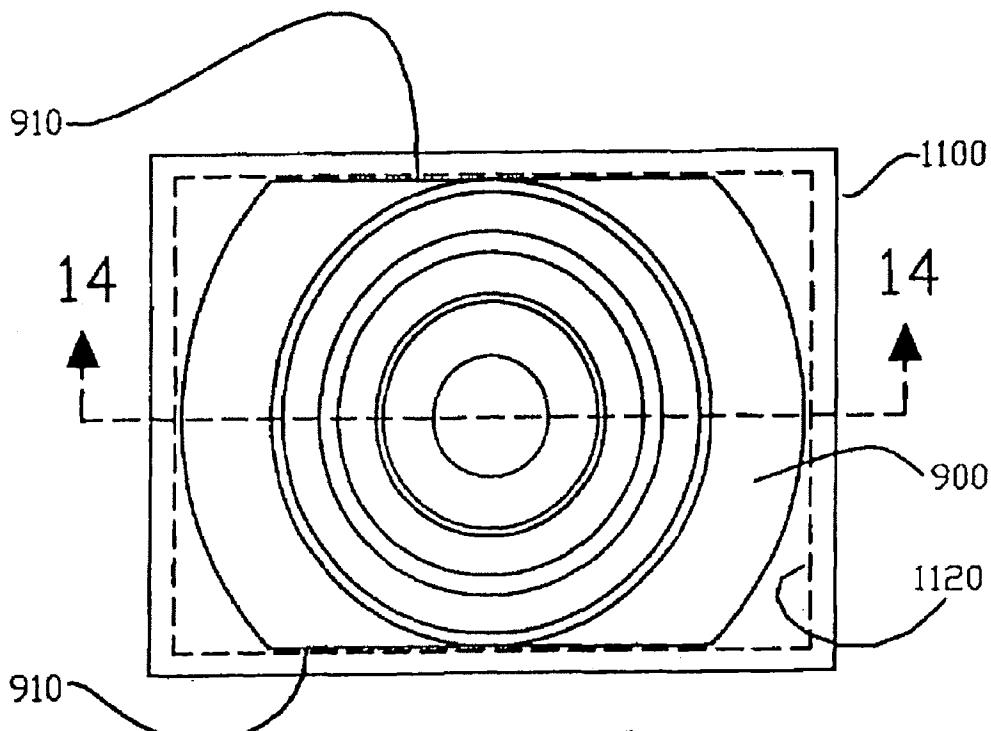


Figure 13



Figure 14

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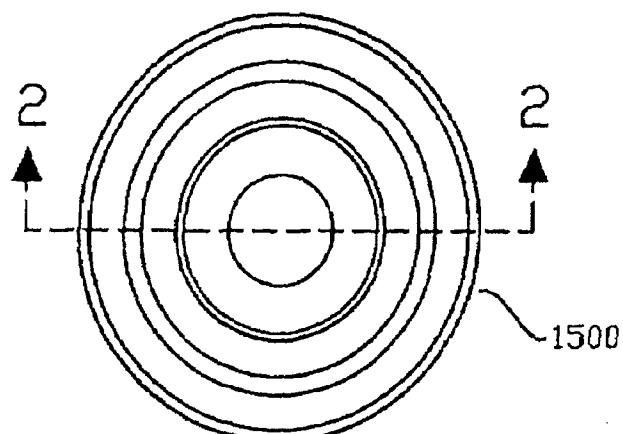


Figure 15



Figure 16

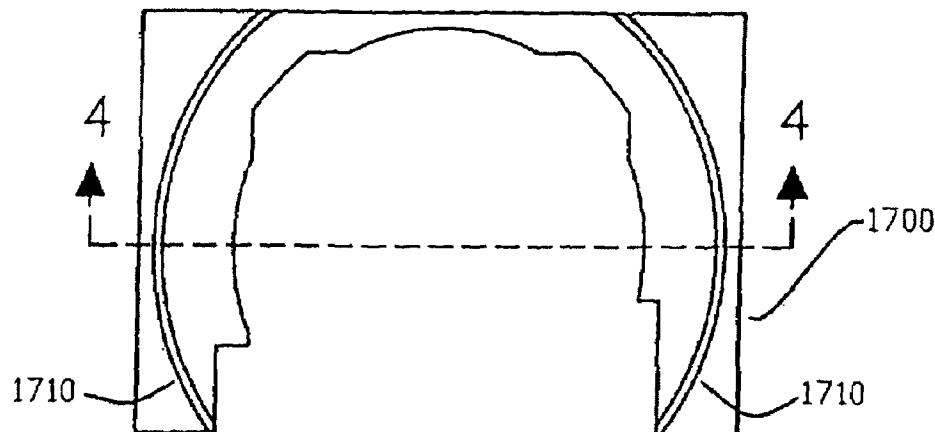


Figure 17

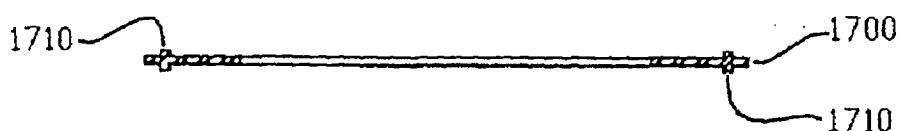


Figure 18

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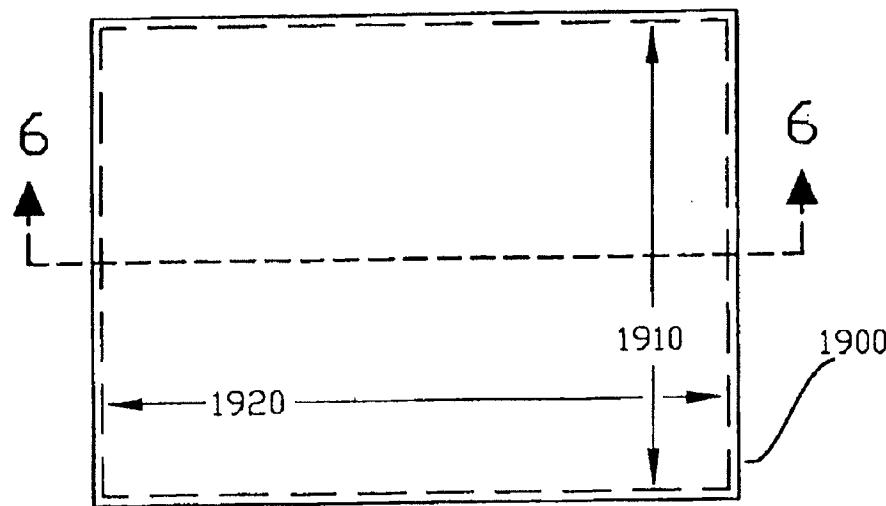


Figure 19

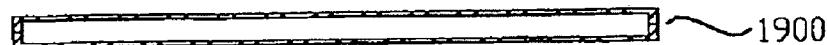


Figure 20

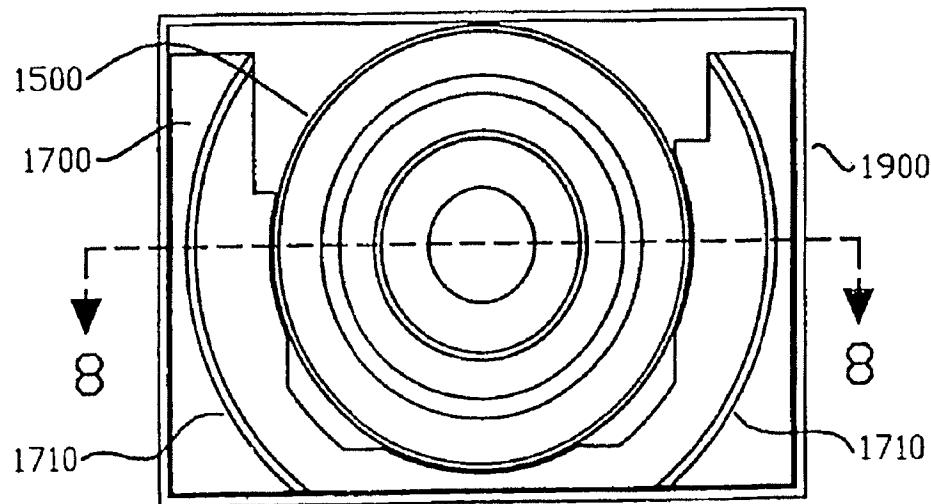


Figure 21

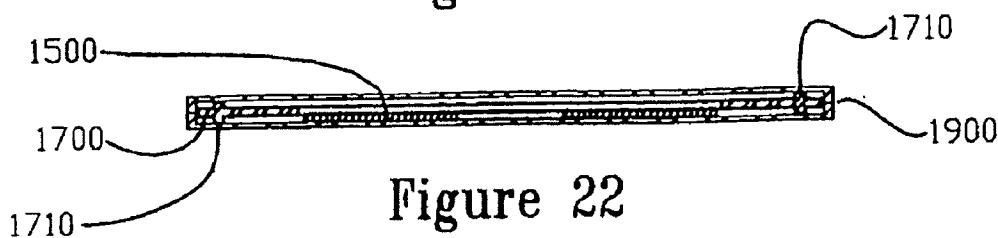


Figure 22

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DATA STORAGE APPARATUS**CROSS-REFERENCE TO RELATED APPLICATIONS**

The present application is a Continuation of U.S. patent application Ser. No. 10/106,857 filed on Mar. 27, 2002, and incorporated herein by reference, which in turn is a Continuation of U.S. patent application Ser. No. 09/170,040, filed on Oct. 13, 1998, and incorporated herein by reference, which in turn claims priority from Provisional U.S. Application Ser. No. 60/062,408, filed Oct. 14, 1997, which is incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates to the field of compact disc (CD) data storage, specifically to a method and apparatus for packaging a smaller size compact disc, or a smaller size compact disc and disc adapter into a credit card, business card, or baseball card/collectors card size.

BACKGROUND OF THE INVENTION

It may be desirable to be able to distribute digital information in a medium as widely accepted and easily carried as a business, credit, or collectors card that can be read or read and written to by a standard CD drive. For example, Spector, U.S. Pat. No. 5,090,561 discusses using a CD-ROM as a baseball collectable (Col. 2, lines 3-10) and provides a case for displaying such collectibles. However, a standard 12 cm CD-ROM is rather large and awkward compared to a standard baseball card, business card, or credit card size format.

It also may be desirable to change the shape of the small compact disc of the invention. It is known that a standard 12 cm in diameter compact disc can be cut (made) to have straight sides and play as a standard 12 cm diameter CD. Such a product is presently marketed under the trade name CyberTract™ and is commercially available through the American Tract Society and made with the cooperation of DISCART™, LLC, which claims copyright to the disc shapes and also claims patents pending.

One such tract, for example, has been marketed using the likeness of the late Mickey Mantle imprinted onto the face of the device. The device is encoded with text, graphics, and video of the late Mickey Mantle discussing his religious conversion. The overall appearance (but not size) of the device is akin to that of a baseball card or collectable, on one side.

The DISCART™ device, however, is made as a cut down (rectangular) version of a standard 12 cm compact disc (CD). This disc maintains the 12 cm diameter at four points to align itself in the CD drive. As a result, the packaged product is larger than a standard baseball card or sports collectable. Thus, products such as the DISCART™ device may not be as readily acceptable for collectors. Such an apparatus, for example, would not fit within standard baseball card holders, drawers, or shelving.

In addition, while the device appears to play satisfactorily in most CD players and CD-ROM drives, after testing the inventor has discovered that the device may create some vibrations or noise when played or used in some CD players or CD-ROM drives. The rectangular shape of the disc creates a slight imbalance or non-aerodynamic shape which may result in vibration in some CD players.

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Another approach is a CD-ROM card marketed as "The Card" by ADIVAN High Tech AG, Switzerland (www.adivan.com). The inventor is unaware of the first disclosure date of the ADIVAN device, and thus does not represent that the device qualifies as "prior art" per se. However, the device is disclosed herein under the spirit of the duty of disclosure.

The ADIVAN device is a CD-ROM provided in a number of shapes and sizes within a specified range. Four "knobs", spaced along a 75 mm diameter circle protrude from the underside of card, to align the card in a CD-ROM drive utilizing the 8 cm depressed portion of the CD-ROM drive tray. The presence of protruding knobs may make the card less useful as a business card device, as the resultant card is no longer flat. As such, storage devices for business cards, baseball cards, and the like, may not readily accept such a card. The knobs also make the card less aerodynamic and cause greater vibration. It would also appear to require a special mold to form the knobs.

One approach to solving such problems might be to use the 8 cm CD of the prior art. It is known that an 8 cm in diameter compact disc made by the Sony Corporation is commercially available. The 8 cm compact disc holds the same type of information that the 12 cm diameter disc can and is playable in standard CD drives. Such CD "singles" have heretofore been used mainly for music applications and the like. However, even an 8 cm CD is too large to fit in a standard baseball or business card size format.

Various adapters are known in the art for attaching to a 8 cm CD to adapt the 8 cm CD for playback on a 12 cm CD player, much as the old spindle adapters were used to play 45 RPM records on LP turntables. These adapters were designed when CD players did not incorporate an 8 cm aligning circle as they do today. Such adapters were also designed for use in compact disc cartridges (Caddys) which are very rare today. These adapters are still helpful today in playing 8 cm CDs in multi-disc cartridges and front loading players. 90 to 95% of CD players used today are tray loading drive types with 8 cm aligning circles, making these adapters unnecessary in the majority of CD players.

Yamamori, U.S. Pat. No. 4,837,784, issued Jun. 6, 1989, discloses one such device. It should be noted that it appears that the device of Yamamori engages the smaller 8 cm disc, thus forming a package which is 12 cm in diameter. Although the device of Yamamori may be suitable for playing back 8 cm discs, the overall structure of the apparatus suffers from some drawbacks.

To begin with, the adapter has a 12 cm outer diameter. Thus, if the adapter is distributed with an 8 cm disc, the overall package size would need to be at least 12 cm in diameter, or that of a standard CD case (e.g., so-called "jewel box"). It also requires excess handling of the 8 cm disc and the possibility of disengagement of the adapter from the disc resulting in damage to the disc or the disc drive.

Eihaus, U.S. Pat. No. 4,889,330, issued Feb. 6, 1990, Published EP application 0,331,389, published Sep. 6, 1989, and EP Patent Specification 0,391,638 published Apr. 19, 1995, all disclose similar CD adapters for adapting an 8 cm CD to a 12 cm format. However, all of those devices appear to suffer from the same fundamental limitations of the Yamamori device. In particular, the overall size of such adapters precludes them from being packaged into a package substantially smaller than a standard 12 cm CD-ROM. Moreover, such devices appear to physically attach to the CD-ROM itself.

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Yamashita et al., U.S. Pat. No. 5,457,677, issued Oct. 10, 1995, discloses an adapter for a smaller CD for use in a multi-CD adapter. The device grips the smaller CD which is then removed from the adapter laterally by the playback apparatus. Such a device may not be readily adaptable to a tray-type CD-ROM player or the like.

Typical CD-ROM drives with opening trays may be provided with a depressed inner portion which may be used to center an 8 cm CD-ROM. Once the CD-ROM is placed in this depression, and the tray closed, the spindle of the CD-ROM drive may engage the center hole of an 8 cm CD-ROM successfully and the 8 cm CD-ROM may be read. Without such a depression, the 8 cm CD-ROM may slide about when the tray is closed, and the spindle may not properly engage, possibly damaging or scratching the 8 cm CD-ROM.

While such a solution may work for an 8 cm CD-ROM, it may not work for other, odd sizes. Given the large installed base of CD-ROM drives, one wishing to distribute a non-standard (e.g., diameter other than 8 cm or 12 cm) CD-ROM size, one cannot expect users to buy new CD-ROM drives with yet a second depression for yet another size CD-ROM.

SUMMARY OF THE INVENTION

In a first embodiment, the present invention may utilize a small compact disc, smaller than the standard 12 cm diameter CD, that will fit inside a card shaped container (if desired). In accordance with the invention, a CD Card device for packaging digital information in a medium as widely accepted and easily carried as a business, credit or collectors card that can be read (or read and written to by drives and disc types so capable) by standard CD drives comprises a small compact disc. This small compact disc is smaller than the standard 12 cm in diameter compact disc commonly used today and the 8 cm compact disc referred to in the Background of the Invention Section above.

The small compact disc of the present invention uses the same technology (materials, and data standards) as does the standard 12 cm diameter CD with the only significant exception being its outside diameter (in a first and third embodiments) or its shape (in a second embodiment). Also, weight may be added to the small compact disc of either embodiment by adding heavier materials and/or increasing the thickness of some outer areas.

The small CD of the present invention may store any data that is stored on a standard 12 cm compact disc, and be read or read and written to if so designed, like any standard 12 cm disc so capable. This is possible because all critical information to allow the proper use of a CD is carried in the innermost part of the area that carries information. Such information falls within the diameter of the small compact disc of the invention. The small compact disc of the invention requires only proper placement in the standard CD drive to perform properly.

The first and third embodiments of the present invention may require an adapter to ensure proper placement. This adapter is discussed in the following paragraph. The second (and preferred) embodiment of the invention may not require an adapter to assure proper placement. Both small compact discs, one embodiment of which may be approximately 5.5 to 6.35 cm in diameter in the case of the first and third embodiments and the other having an approximate width of 5.5 to 6.35 cm and a length of 8 cm in the case of the second (and preferred) embodiment, will have less storage capacity than the standard 12 cm in diameter compact disc.

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An adapter is designed for use with the first and third embodiments of the present invention. The adapter is designed to position the small compact disc of the first and third embodiments correctly so that it will be accepted by the CD drive. The adapter is also stored within the card shaped container. One embodiment of the adapter may stretch across (over) the 8 cm disc aligning circle (available with tray loading CD drives), being kept in position by protruding arc shaped ridges. In this position it will align the small compact disc for proper use.

First, the adapter is placed in the CD drive tray, then the small compact disc is placed within it. The adapter will remain in its initial position in the tray as the small compact disc is lifted out of it by the drive mechanism for use. The small compact disc will be returned to the adapter by the drive mechanism when the small compact disc is no longer in use.

The small compact disc of the second embodiment (and preferred) of the present invention, when placed in the tray, will be in the proper position as a result of its shape.

A card shaped container may hold the small compact disc in a manner to protect it from the casual handling that is common to business, credit and collector cards, the type of handling that could damage a compact disc. It also may hold the adapter (in the first and third embodiments) used to position the small compact disc. The container permits removal and replacement of the small compact disc (and the adapter, in the first and third embodiments) from within the card. The card may be designed to display information similar to a credit, business or collectors card on its surfaces.

In its preferred embodiment the CD card may be offered as a digital collectors card, for example a baseball, football, or basketball card. It may also be offered as a digital card displaying the common sights at vacation areas to remind vacationers of their trip while using their computer. One way in which the information may be displayed is in the format of a screen saver. The card may also be used as would a conventional business card but with the added dimension of conveying large amounts of digital information to its recipient. There are many possible uses for the CD Card only some of which are described here.

It is known that in a small percentage of CD drives (less than 5%) a larger adapter for the first and third embodiments or a newly designed adapter for the second embodiment may be needed. If it is desired that the smaller compact discs be read in those CD drives, a special larger adapter may be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be readily carried into effect, it will now be described with the accompanying drawings wherein:

FIG. 1 is a top plan view of a first embodiment of the small compact disc of the present invention.

FIG. 2 is a cross-section view taken along lines 2-2 of FIG. 1.

FIG. 3 is a top plan view of a first embodiment of the adapter of the present invention.

FIG. 4 is a cross-section view taken along lines 4-4 of FIG. 3.

FIG. 5 is a top plan view of a first embodiment of the card shaped container of the present invention.

FIG. 6 is a cross-section view taken along lines 6-6 of FIG. 5.

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FIG. 7 is a top plan view of the first embodiment of the present invention of the card shaped container with the adapter and small compact disc carried inside.

FIG. 8 is a cross-section view taken along lines 8-8 of FIG. 7.

FIG. 9 is a top plan view of a second (and preferred) embodiment of the small compact disc of the present invention.

FIG. 10 is a cross-section view taken along lines 10-10 of FIG. 9.

FIG. 11 is a top plan view of a second embodiment of the card shaped container of the present invention.

FIG. 12 is a cross-section view taken along lines 12-12 of FIG. 11.

FIG. 13 is a top plan view of a second embodiment of the present invention of the card shaped container with the small compact disc carried inside.

FIG. 14 is a cross-section view taken along lines 14-14 of FIG. 13.

FIG. 15 is a top plan view of a third embodiment of the small compact disc of the present invention.

FIG. 16 is a cross-section view taken along lines 2-2 of FIG. 15.

FIG. 17 is a top plan view of a third embodiment of the present invention illustrating an adapter.

FIG. 18 is a cross-section view taken along lines 4-4 of FIG. 17.

FIG. 19 is a top plan view of a third embodiment of the card shaped container of the present invention.

FIG. 20 is a cross-section view taken along lines 6-6 of FIG. 19.

FIG. 21 is a top plan view of the third embodiment of the present invention illustrating the card shaped container with the adapter and small compact disc carried inside.

FIG. 22 is a cross-section view taken along lines 8-8 of FIG. 21.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 is a top plan view of a first embodiment of the small compact disc of the present invention. Disc 100 uses the same technologies, materials, and data standards as does the standard 12 or 8 cm CD, with the only significant exception being that its outside diameter is substantially smaller than a typical prior art 8 or 12 cm compact disc. In the preferred embodiment, the disc is approximately 5.5 to 6.35 cm in diameter.

FIG. 2 is a cross-section taken along lines 2-2 of FIG. 1, illustrating a cross-sectional view of disc 100.

FIG. 3 is a top plan view of an adapter of the first embodiment of the present invention. Adapter 300 may be substantially "C"-shaped having an outer diameter of approximately 8 cm. Adapter 300 may be provided with lands 320 which may be adapted to receive the disc 100 when it is placed upon lands 320. Adapter 300 may also be provided with a ridge 310, the function of which will be described below.

Note that adapter 300, although adapted to approximately 8 cm disc circle, maintains an overall form factor of approximately 8 cm by 6 cm, allowing it to be packaged in a credit card, business card, or collectible card type packaging. Note that in the case of a business card embodiment, a slightly larger than normal business card size may be required in order to provide sufficient width for data tracks beyond the width of the center hole.

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FIG. 4 is a cross-section of adapter 300 taken along lines 4-4 of FIG. 3. In use, disc 100 may be placed upon lands 320 and the entire combination of adapter 300 and disc 100 placed into a CD-ROM drive. Adapter 300 will rest in the depression of the CD-ROM drive designed for an 8 cm disc. Note that disc 100 merely rests upon lands 320 and lands 320 do not in any way necessarily engage or grip disc 100. Once the tray of the CD-ROM drive is closed, the spindle will pick up disc 100 from its resting surface on lands 320. Adapter 300 will remain in the depression formed in the CD-ROM drive after disc 100 has been picked up and engaged by the CD-ROM drive.

When the tray to the CD-ROM drive is opened, the spindle of the CD-ROM drive will lower disc 100 back onto adapter 300 and the drive door will open. Without the use of adapter 300, the disc may fall through the center portion of the drive or become jammed.

FIG. 5 is a top plan view of a first embodiment of the present invention of the card shaped container 500. Card shaped container 500 may be suitably formed from transparent plastic or the like to allow a user to view the contents including any materials imprinted on disc 100. Alternately, card shaped container 500 may be formed from opaque or translucent plastic and/or have indicia printed thereon or printed on labels applied to the card. Card shaped container 500 may have an interior opening 520 along with a slot portion 510 which function will be described below.

FIG. 6 is a cross-section of the card shaped container 500 taken along lines 6-6 of FIG. 5.

FIG. 7 is a top plan view of the first embodiment of the present invention of the card shaped container 500 with adapter 300 and small compact disc 100 carried inside. FIG. 8 is a cross-section taken along lines 8-8 of FIG. 7. As illustrated in FIGS. 7 and 8, the combination of disc 100 and adapter 300 may be suitably slid into card shaped container 500. Note that in FIG. 7, the top portion of card shaped container 500 is not shown for purposes of illustration. Ridge 310 slides within slot portion 510 in such a manner as to allow a user to easily slide out adapter 300 and disc 100 from card shaped container 500.

It should be noted from FIGS. 7 and 8 that, unlike the prior art, the present invention provides a means by which a smaller disc along with an adapter may be packaged together into a smaller form factor package. Thus, a user need not purchase an additional bulkier adapter which does not fit into the business card or baseball card form factor. Moreover, the use of a circular disc eliminates any wobble, imbalance, and aerodynamic problems present in prior art rectangular discs.

FIG. 9 is a top plan view of a second embodiment of the present invention of a small compact disc 900 having a length 908 and a diameter 906. Disc 900 may be provided with a nominal diameter of approximately 8 cm, but having substantially parallel portions 910. The distance between substantially parallel portions 910 may be approximately 5.5 to 6.35 cm. Data may be written into that portion of the disc having a diameter 912 less than the distance between substantially parallel portions 910. Although disc 900 is not round (as with disc 100), unlike prior art rectangular discs, disc 900 is smaller with a greater percentage of arcuate, convex edges 902 of the disc being circular and thus making it more aerodynamic, easier to balance, and simpler to align in the depressed portion (8 cm diameter circle) of the compact disc reader tray. Disc 900 may optionally be provided with balancing weights in the form of denser or thicker portions 904 which may serve to dynamically balance disc 900.

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FIG. 10 is a cross-section taken along lines 10-10 of FIG. 9.

FIG. 11 is a top plan view of a second embodiment of the present invention of the card shaped container. Card shaped container 1100 may be provided with an internal portion 1120. FIG. 12 is a cross-section taken along lines 12-12 of FIG. 11, illustrating the internal portion 1120 of card shaped container 1100. Although not illustrated in FIGS. 11 and 12, card shaped container 1100 may be provided with an opening at one end, or in the alternative, the top portion may slide open or may be hinged to open much as in a typical prior art CD-ROM "jewel box" case.

FIG. 13 is a top plan view of a second embodiment of the present invention of the card shaped container with the small compact disc carried inside. As illustrated in FIG. 13, disc 900 may be placed within the internal portion 1120 of card shaped container 1100. Card shaped container 1100 may be provided with an open portion approximately 5.5 to 6.35 cm by 8 cm so as to allow disc 900 to fit therein.

FIG. 14 is a cross-section taken along lines 14-14 of FIG. 13, illustrating a cross-section of the combined apparatus.

FIG. 15 is a top plan view of a third embodiment of the present invention of the small compact disc. Disc 1500 is similar for all intents and purposes as disc 100 of FIG. 1.

FIG. 16 is a cross-section taken along lines 2-2 of FIG. 15.

FIG. 17 is a top plan view of the third embodiment of the present invention illustrating an adapter. The adapter of FIG. 17 differs slightly from that of FIG. 3 in that the overall adapter does not have rounded edges. Rather, raised edges 1710 are provided at a diameter approximately 8 cm across the center of adapter 1700. Raised edges 1710 may rest inside a depressed portion of a CD-ROM drive designed to accommodate 8 cm discs. Disc 1500 may be carried on adapter 1700 on lands, such as lands 320 shown in FIG. 3. In the alternative, adapter 1700 may merely center disc 1500 and thus not actually carry or be in contact with disc 1500.

FIG. 18 is a cross-section taken along lines 4-4 of FIG. 17, illustrating the shape of raised edges 1710.

FIG. 19 is a top plan view of a third embodiment of the present invention of the card shaped container. Card shaped container 1900 may be provided with an internal portion having dimensions 1910 and 1920 being approximately 5.5 to 6.35 cm and 8.5 cm respectively.

FIG. 20 is a cross-section taken along lines 6-6 of FIG. 19.

FIG. 21 is a top plan view of a third embodiment of the present invention illustrating the card shaped container with the adapter and small compact disc carried inside. As illustrated in FIG. 21, card shaped container 1900 is sized so as to hold both adapter 1700 and disc 1500 compactly therein. Again, although not illustrated in the Figures, card shaped container 1900 may be provided with an opening top or side portion to allow disc 1500 and adapter 1700 to slide out or be removed.

FIG. 22 is a cross-section view taken along lines 8-8 of FIG. 21.

While the preferred embodiment and various alternative embodiments of the invention have been disclosed and described in detail herein, it may be apparent to those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope thereof.

I claim:

1. A data storage apparatus for distribution as a business card, credit card, or collector card, the data storage apparatus comprising:

an optically encoded non-rectangular disc having a diameter between substantially 8 centimeters and less than

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12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel portions and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

2. The data storage apparatus of claim 1, wherein the at least two parallel portions are spaced approximately 5.5 to 6.35 centimeters from one another.

3. The data storage apparatus of claim 2, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

4. An optically encoded non-rectangular disc having a diameter between substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel portions and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

5. The optically encoded non-rectangular disc of claim 4, wherein the at least two parallel portions are spaced approximately 5.5 to 6.35 centimeters from one another.

6. The optically encoded non-rectangular disc of claim 5, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

7. An optically encoded non-rectangular disc having a diameter between substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded disc has a non-round shape including at least two substantially parallel portions and a diameter along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader, and the disc comprises at least two portions which are denser than other portions, wherein the denser portions provide a balancing weight so as to dynamically balance the disc when the disc is rotated in the disc reader.

8. The optically encoded non-rectangular disc of claim 7, wherein the at least two parallel portions are spaced approximately 5.5 to 6.35 centimeters from one another.

9. The optically encoded non-rectangular disc of claim 8, wherein the diameter along the major axis of the optically encoded disc is substantially 8 centimeters.

10. An optically encoded non-rectangular disc having a length of substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded non-rectangular disc has a non-round shape including at least two substantially parallel portions and a length along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader.

11. The optically encoded non-rectangular disc of claim 10, further comprising at least two arcuate portions.

12. The optically encoded non-rectangular disc of claim 11, wherein at least two arcuate portions are concave.

13. The optically encoded non-rectangular disc of claim 11, wherein at least two arcuate portions are convex.

14. The optically encoded non-rectangular disc of claim 11, wherein the at least two parallel portions are spaced approximately 5.5 to 6.35 centimeters from one another.

15. The optically encoded non-rectangular disc of claim 14, wherein the length of the optically encoded disc is substantially 8 centimeters.

16. The optically encoded non-rectangular disc of claim 15, wherein the length of said disc is longer than the diameter of said disc.

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17. The optically encoded non-rectangular disc of claim 11, comprising at least one concave arcuate portion and one convex arcuate portion.

18. An optically encoded non-rectangular disc having a length of substantially 8 centimeters and less than 12 centimeters, wherein said optically encoded non-rectangular disc has a non-round shape including at least two substantially parallel portions and a length along a major axis sufficient to span a corresponding 8 cm depressed portion in a disc reader tray so as to support and align the optically encoded disc in a disc reader, and the disc comprises at least two portions which are denser than other portions, wherein

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the denser portions provide a balancing weight so as to dynamically balance the disc when the disc is rotated in the disc reader.

19. The optically encoded non-rectangular disc of claim 18, wherein the at least two parallel portions are spaced approximately 5.5 to 6.35 centimeters from one another.

20. The optically encoded non-rectangular disc of claim 19, wherein the length of the optically encoded disc is substantially 8 centimeters.

* * * * *

EXHIBIT E



US005982736A

United States Patent [19]**Pierson****Patent Number: 5,982,736****Date of Patent: Nov. 9, 1999****[54] TRADING CARD OPTICAL COMPACT DISC AND METHODS OF USING AND FORMING SAME****[76] Inventor: Gerald A. Pierson, 9931 Rivercrest Ct., Orlando, Fla. 32825****[21] Appl. No.: 08/856,915****[22] Filed: May 15, 1997****[51] Int. Cl.⁶ G11B 7/24****[52] U.S. Cl. 369/273; 369/286****[58] Field of Search 369/77.1, 272, 369/273, 274, 281, 283, 286, 292; 360/135, 137****[56] References Cited****U.S. PATENT DOCUMENTS**

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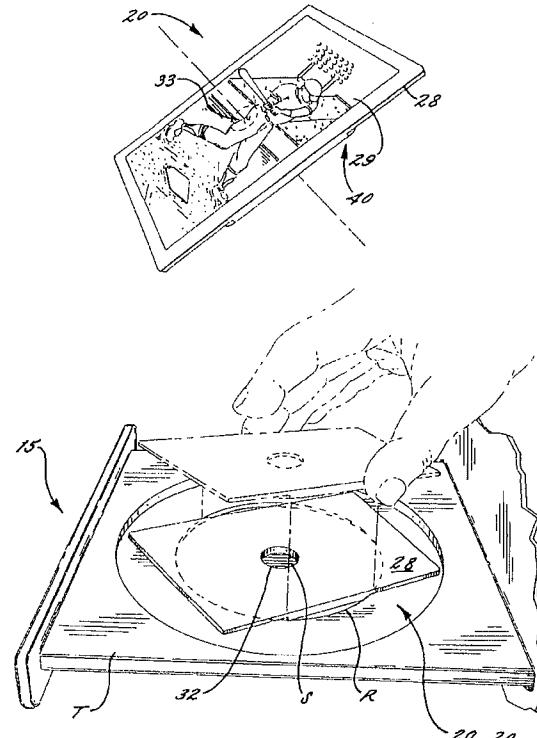
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Primary Examiner—William R. Korzuch

Attorney, Agent, or Firm—Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.

[57] ABSTRACT

A trading card optical compact disc and method of using and forming the compact disc are provided which are compatible with a disc reader having a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon. The trading card optical compact disc according to an embodiment of the invention preferably has at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. A second metallic layer is formed on at least portions of the first plastic layer, and a third protective layer is formed on at least the second layer for protecting the metallic layer. An indicia bearing fourth layer is formed on the third layer and has a generally planar upper surface for displaying indicia therefrom. An opening extends through the first, second, third, and fourth layers in a medial portion thereof. A trading card interface seat is preferably integrally formed in at least the first layer for seating the trading card onto a loading tray of a disc reader so as to interface with only portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

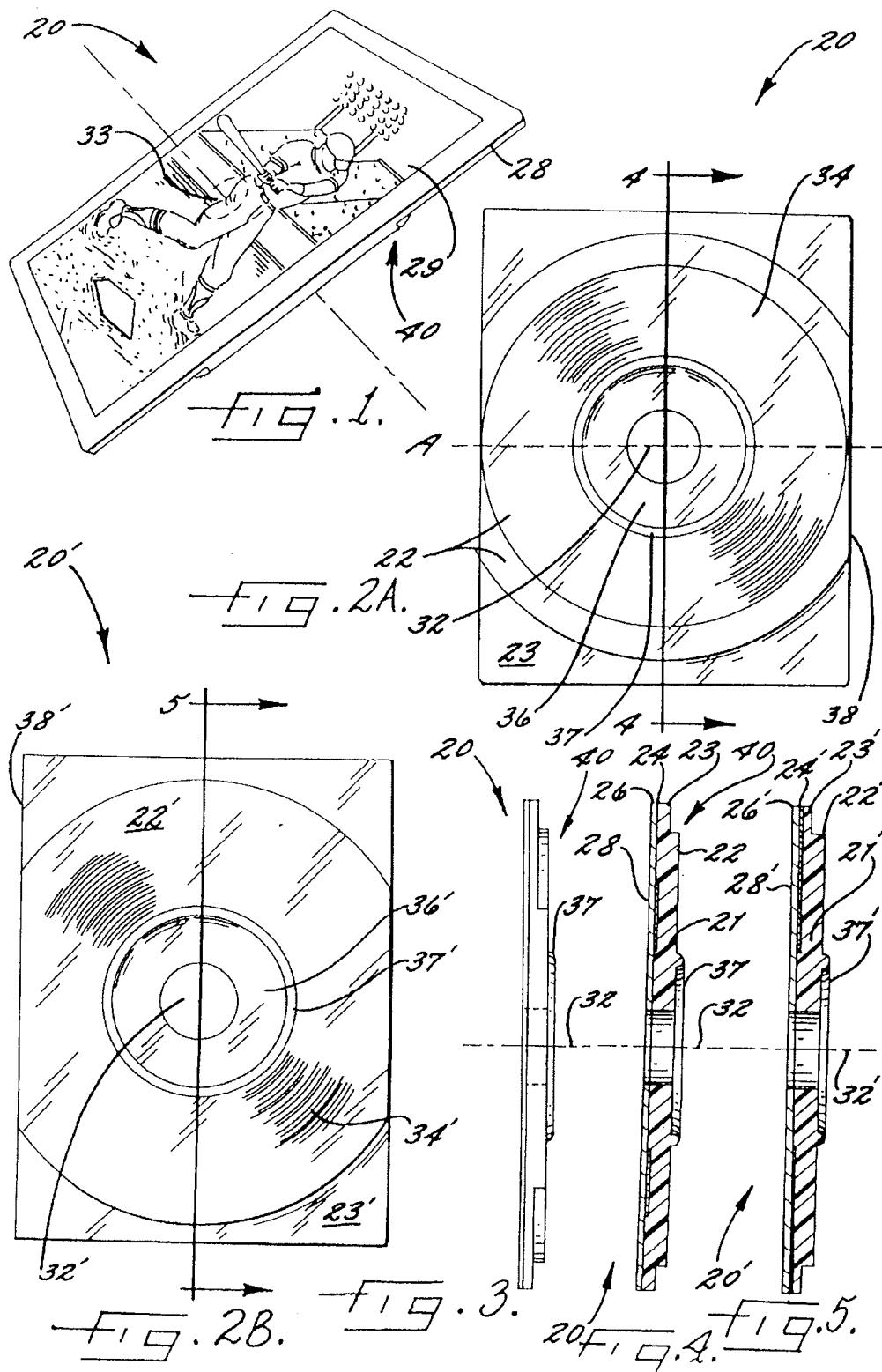
26 Claims, 3 Drawing Sheets

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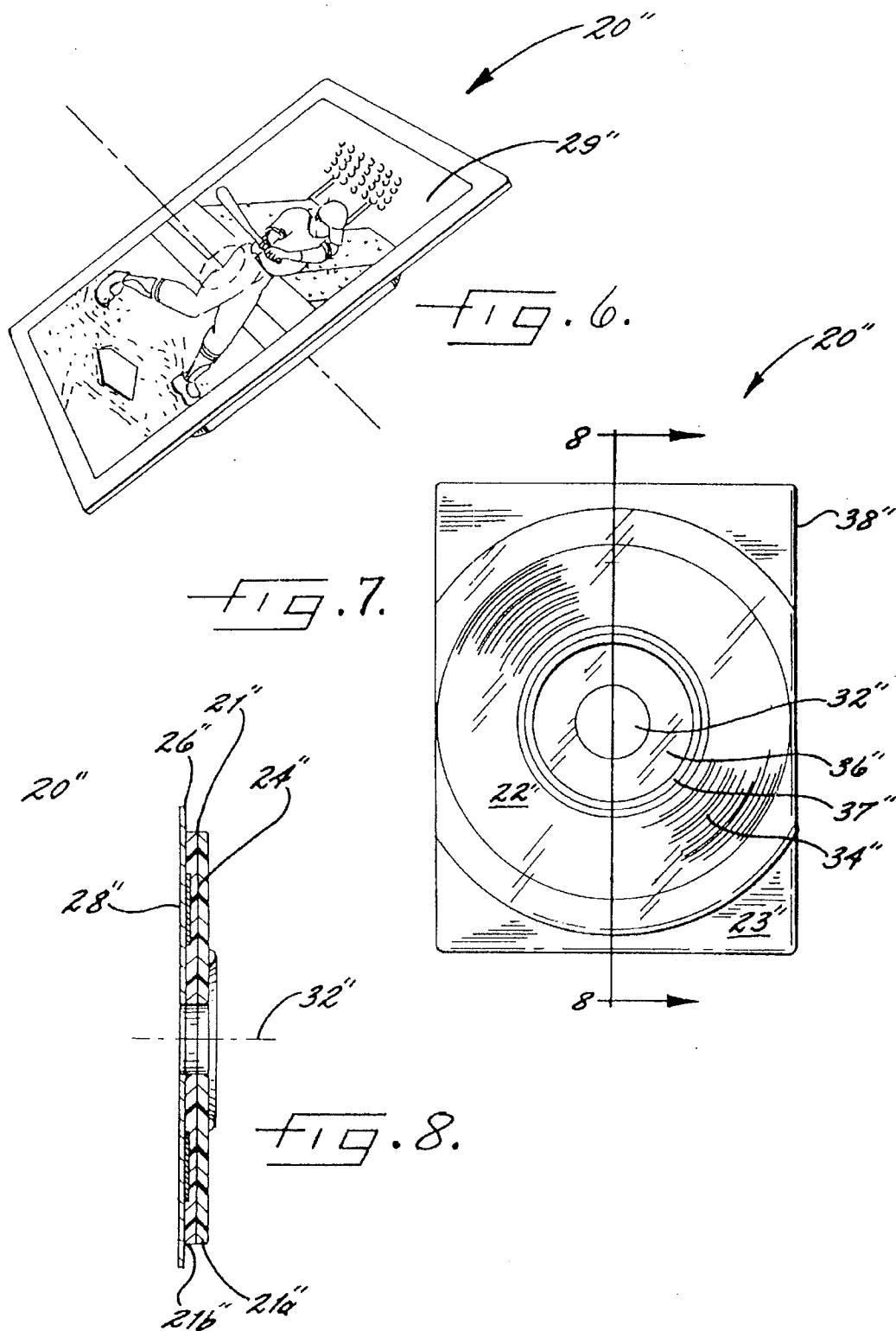


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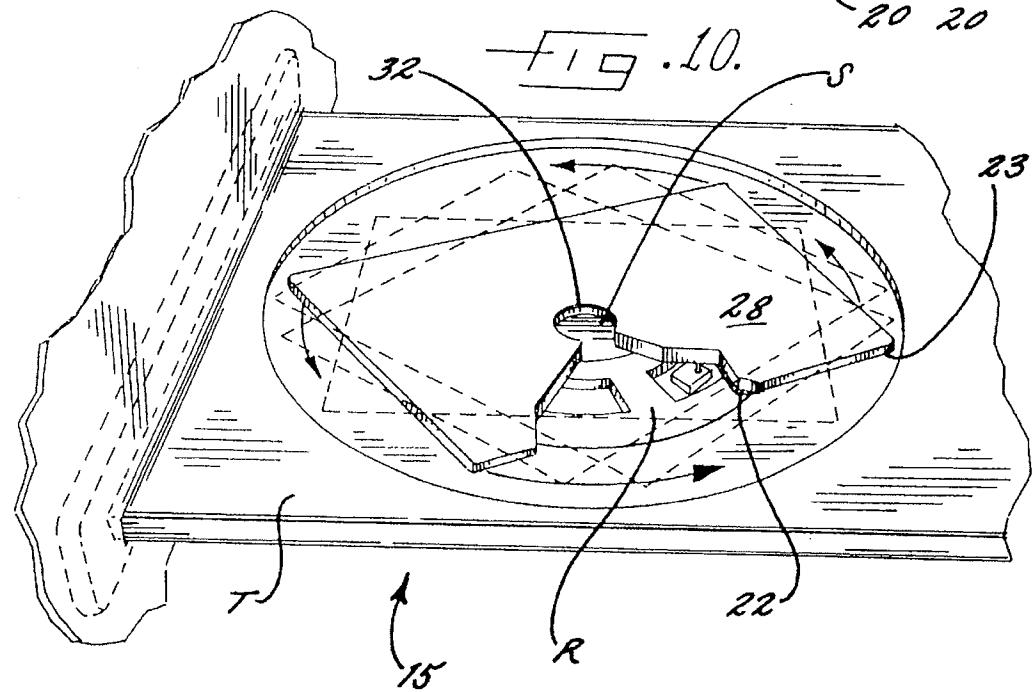
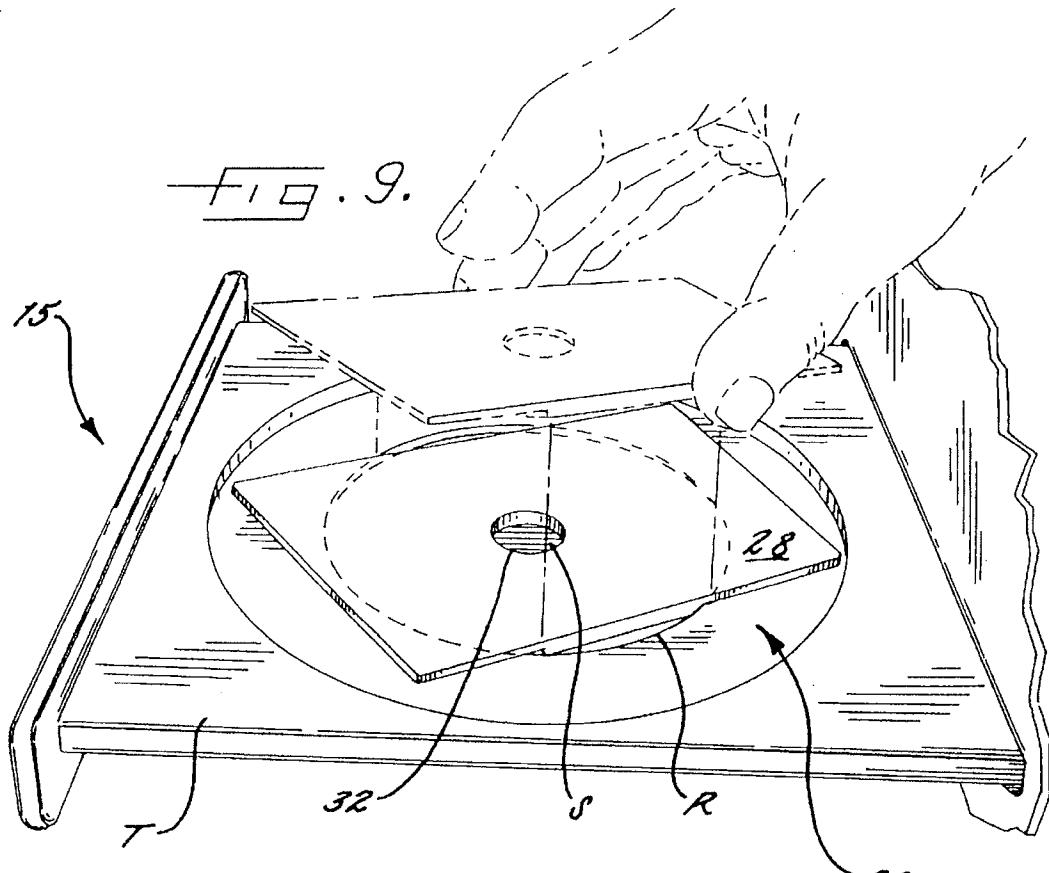


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**TRADING CARD OPTICAL COMPACT DISC
AND METHODS OF USING AND FORMING
SAME**

FIELD OF THE INVENTION

This invention relates to novelty trading items and, more particularly, to novelty trading items for storing and communicating data to enthusiasts, hobbyists, and collectors.

BACKGROUND OF THE INVENTION

Over the years the trading card industry has developed as both a novelty item and a collectors item. As time goes by, the value of many of these trading cards which have printed indicia thereon has increased so that the trading card industry has grown significantly over the years and many trading cards have substantially increased in value. As technology has changed, however, various types of trading cards and methods of storing and communicating data have been developed.

The concept of associating card devices which store and communicate information to a user with indicia or an image thereon has been known for many years. Examples of such devices can be seen in U.S. Pat. No. 3,691,312 by Petersen titled "*Tape Recording Apparatus And System Having A Very Thin Cassette*," U.S. Pat. No. 4,904,853 by Yokokawa titled "*Dual-Function Information-Carrying Sheet Device*," U.S. Pat. No. 5,411,259 by Pearson et al. titled "*Video Sports Game System Using Trading Cards*," and U.S. Pat. No. 5,433,035 by Bauer titled "*Talking Entertainment Card*." These prior card devices, however, either used older methods of storing and communicating information such as cassettes or used integrated circuit technology. Accordingly, these prior methods can be expensive and complex to manufacture even in large volumes and neither understood nor appreciated the benefits, capabilities, design, or construction of optical digital data storage devices, and more particularly optical compact discs. Only recently has the technology and concepts related to the use of optical digital data storage devices really increased and been accepted in the market so that the relative price of optical digital data storage media has decreased dramatically.

Conventional compact discs, for example, are conventionally fabricated in either 80 millimeter ("mm") or 120 mm sizes and are formed of generally rigid plastic discs. As understood by those skilled in the art, the discs are often formed by the use of a mold-based replication system using injection molding techniques. Each compact disc includes a series of either circular or spiral data tracks which are illuminated and read by a source of coherent light such as a laser. In producing these compact discs, data is optically mastered from data files and positive copies of the data are made. Die stampers are produced from electroplated shims, and discs are molded from the negative images on the die stampers. The discs are then individually metalized, and a lacquer coating is applied to each disc. The layer of rigid plastic positioned between each data track and the source of coherent light provides structural rigidity, protects the data tracks, and also functions as a single integral lens element to refract and focus the coherent light beam onto a selected data track. A disc label is also printed, and the disc inserted into a clam shell or other package for shipment to customers.

Recently, however, other thin film digital data storage medium and methods of manufacturing digital data storage media have been developed including for use with trading cards. An example of this thin film digital data storage medium and related methods can be seen in U.S. Pat. No.

5,579,296 by Smith et al. titled "*Optically Readable Thin Film Digital Data Storage Medium*." These recently developed trading cards, however, require extensive and new manufacturing investments, require a special adaptor to make the trading cards compatible with compact disc playing systems, and can be inhibited by marketing and manufacturing constraints, including the additional special adaptor, which can make this recently developed technology less commercially feasible.

SUMMARY OF THE INVENTION

With the foregoing in mind, the present invention provides a trading card optical compact disc and methods of using a compact disc which are readily compatible with existing disc readers and relatively inexpensive to manufacture. The present invention also advantageously provides a trading card optical compact disc and method of forming a trading card that stores and communicates trading card information to a user of a disc reader in a manner that is relatively easy to manufacture in conjunction with known optical compact disc manufacturing techniques and thereby does not require extensive additional molding and tooling costs. The present invention further provides a trading card optical compact disc which does not require a separate special adapter for compatibility with existing disc readers.

More particularly, a trading card optical compact disc and method of using and forming the compact disc are provided which are compatible with a disc reader having a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon. The trading card optical compact disc according to a first embodiment of the present invention preferably has at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. A second metallic layer if formed on at least portions of the first plastic layer, and a third protective layer is formed on at least the second layer for protecting the metallic layer. An indicia bearing fourth layer is formed on the third layer and has a generally planar upper surface for displaying indicia therefrom. An opening extends through the first, second, third, and fourth layers in a medial portion thereof. Trading card interface seating means is preferably integrally formed in at least the first layer for seating the trading card onto a loading tray of a disc reader so as to interface with only portions of the seating ring and not other portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

According to the present invention, the trading card seating means is preferably provided by the at least a first plastic layer which has a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height. The major elevational portion has the encoded digital data thereon, and the minor elevational portion is preferably devoid of the encoded digital data. For alignment, balancing, and compatibility purposes, the major elevational portion is advantageously formed in a medial portion of the trading card and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extend generally linearly between each of the first pair of spaced-apart outer peripheries. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational

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portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries. The encoded digital data of the major elevational portion of the first layer is formed within a circular data zone and preferably does not cover, i.e., less than, the entire surface area of the major elevational portion of the first layer. The circular data zone has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches. The circular data zone is preferably capable of storing between 60–70 Megabytes of information or data therein in some compact disc formats, e.g., audio or CD-ROM, or 450–500 Megabytes in other compact disc formats, e.g., digital video. A first non-metallic zone surrounds and extends outwardly a predetermined distance from the medial opening, and a second non-metallic zone extends inwardly from the rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

By the provision of the trading card interface seating means, the trading card optical compact disc of the present invention advantageously allows a user thereof to readily position the disc into a conventional disc reader with any separate special attachments, adapters, or fasteners. The positioning of and construction of the trading card interface seating means also enables the disc to balance and rotate effectively within conventional disc reader. By not requiring a separate adapter, the trading card optical compact disc advantageously can be easier to use and, in some embodiments, easier and less expensive to manufacture.

A method of using a trading card optical compact disc to communicate digitally encoded data to a user of an optical disc reader is also provided according to the present invention. The method preferably includes positioning a trading card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of a disc reader so that the compact disc interfacingly seats onto only portions of a seating ring and not other portions of the seating ring of the disc reader.

Additionally, methods of forming a trading card optical compact disc are provided according to the present invention. A method preferably includes molding at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. The at least a first plastic layer preferably includes a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height. The major elevational portion has the encoded digital data thereon and the minor elevational portion is devoid of the encoded digital data.

Another method of forming a trading card optical disc preferably includes positioning a compact disc having a pattern of digital data encoded thereon onto a medial portion of a surface of a trading card having a width of about 2.5 inches and a length of about 3.5 inches, the combination of the compact disc and the trading card having a major elevational portion and a minor elevational portion so that the major elevational portion interfacingly seats the combination onto a loading tray of a disc reader so as to interface with only portions of the seating ring and not other portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc. The major elevational portion has the encoded digital data thereon, and the minor elevational portion is preferably devoid of the encoded digital data. The major elevational portion has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major eleva-

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tional portion. Each of the first pair of space-apart outer side peripheries arcuately extends between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extends generally linearly between each of the first pair of spaced-apart outer peripheries.

Because the trading card optical compact disc and associated methods were conceived and developed while keeping in mind the commercial viability and ease of manufacturing, the trading card optical compact disc is preferably formed using conventional compact disc manufacturing techniques. This, for example, advantageously allows training, tooling, and other associated manufacturing costs to be reduced and advantageously provides incentives for manufacturers to more readily accept the technology for manufacturing purposes. In contrast to other known concepts, by providing incentives to make this technology readily manufacturable by existing compact disc manufacturers, the present invention achieves a significant goal in reducing the overall price of the end product to ultimate purchasers.

BRIEF DESCRIPTION OF THE DRAWINGS

Some of the features, advantages, and benefits of the present invention having been stated, others will become apparent as the description proceeds when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of trading card optical compact disc according to the present invention;

FIG. 2A is a bottom plan view of a trading card optical compact disc according to a first embodiment of the present invention;

FIG. 2B is a bottom plan view of a trading card optical compact disc according to a second embodiment of the present invention;

FIG. 3 is a side elevational view of a trading card optical compact disc according to a first embodiment of the present invention;

FIG. 4 is a vertical sectional view of a trading card optical compact disc according to taken along line 4—4 for FIG. 2A according to a first embodiment of the present invention;

FIG. 5 is a vertical sectional view of a trading card optical compact disc taken along line 5—5 of FIG. 2B according to a second embodiment of the present invention;

FIG. 6 is a perspective view of a trading card optical compact disc according to the third embodiment of the present invention;

FIG. 7 is a bottom plan view of a trading card optical compact disc according to the third embodiment of the present invention;

FIG. 8 is a vertical sectional view of a trading card optical compact disc taken along the line 8—8 of FIG. 7 according to the third embodiment of the invention;

FIG. 9 is a perspective view of a trading card optical compact disc being positioned into a disc reader according to a first embodiment of the present invention; and

FIG. 10 is a fragmentary perspective view of a trading card optical disc positioned in a disc reader and being rotated for reading digital data therefrom.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in

which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout, and prime and double prime notation are used to indicate similar elements in alternative embodiments.

FIG. 1 illustrates a perspective view of a trading card optical compact disc 20 according to an embodiment of the present invention. The trading card optical compact disc 20 is preferably compatible with a disc reader 15 (see FIGS. 9-10) which includes a centrally located spindle S and a seating ring R of a loading tray T for supporting and rotating a compact disc ("CD") positioned thereon. The trading card optical compact disc 20 has at least a first plastic rectangular layer 21 having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon, i.e., pits and tracks as understood by those skilled in the art. The plastic of the first layer 21 is preferably a polycarbonate material or other optically transparent embossable plastic material as understood by those skilled in the art.

Various formats or data categories, including compact disc audio data, digital video disc ("DVD"), and/or compact disc read-only-memory ("ROM") data can be embossed into and stored on the first layer 21 by techniques known to those skilled in the art. For trading card applications (see FIG. 1), for example, digital data including visual information of photographs, video, textual information such as a person's or team's statistics and biographies, historical information, music, narration, and other data can be stored and recalled at will be a user of a disc reader 15. As understood by those skilled in the art, these trading card applications, for example, can include sports, music, entertainment, publishing, book, magazine, topical information, or various other types and formats of trading cards.

A conventional compact disc reader 15, for example, can include a loading tray T having a centrally located spindle S and a seating ring R for supporting and rotating a compact disc having planar upper and lower surfaces and embedded data tracks consisting of the encoded digital data. A compact disc reader 15 also has a digital data reading system which includes a source of light positioned for generating a light beam to illuminate the data tracks. A light beam is reflected from the data tracks and is modulated by the encoded digital data. A digital reading system of the compact disc reader 15 receives and converts a corresponding electrical signal for processing the read data, e.g., by a microprocessor-based decoding system.

Preferably, as illustrated in FIGS. 2A-2B, 3-5 and 8, a second metallic layer 24 is formed on at least portions of the first plastic layer 21, e.g., portions of or the entire major elevational portion 22 of the first plastic layer (see FIGS. 2A and 4). The metallic layer 24 preferably includes an aluminum material, such as conventionally used with forming optical compact discs, silver material, gold material, or other reflective metal material. The second layer 24 preferably provides a reflective surface for the light beam after it passes through the first optically transparent plastic layer 21 when attempting to read the digitally encoded data from the disc 20. As illustrated in FIGS. 2B and 5, for ease of manufacturing and aesthetic purposes, a second embodiment of the trading card 20' illustrates that the second layer 24' can also extend substantially the full length and width of the trading card optical compact disc 20'. The second embodiment also

includes a first layer 21', a major elevational portion 22', the second layer 24', a third layer 26', a fourth indicia bearing layer 28', and a medial opening 32' extending therethrough (see also opening 32" of FIG. 8) as illustrated. In either the first or second embodiments of the trading card optical compact disc 20, 20', however, a non-metallic zone 23, 23' (see also 23" of FIG. 7) is preferably formed around the entire peripheries of the trading card optical compact disc 20, 20'.

Additionally, a third protective layer 26 is preferably formed on at least the second layer 24 for protecting the metallic layer 24 such as from chipping, flaking, or other damage. The third layer 26 is preferably a lacquer material or other thin hard coat material which is formed on the first and second layers 21, 24 to enhance the scratch resistance and provide other protection for these layers 21, 24. A fourth indicia bearing layer 28 is preferably formed on the third layer 26 and has a generally planar upper surface for displaying indicia 29 therefrom (see also indicia 29" of FIG. 6). The indicia 29 is preferably a photograph, sketch, textual information, or other images formed by ink or other material formed or positioned onto either the lacquer layer or formed by another material, e.g., paper or plastic, formed on or adhered to the lacquer layer 26. Also, for example, if the indicia bearing layer is a paper material adhered to the lacquer layer 26, then an adhesive is preferably positioned therebetween. The thickness of the combination of the first, second, third, and fourth layers 21, 24, 26, 28 of the first and second embodiments is preferably less than about 0.06 inches or 1.5 mm.

As best shown in FIGS. 6-8, the thickness of the combination of the first, second, third, and fourth layers 21", 24", 26", 28" of the third embodiment of a trading card optical compact disc 20", e.g., a DVD format, which preferably uses a digital video data format is also preferably less than about 0.06 inches or 1.5 mm. This embodiment, as understood by those skilled in the art, preferably has at least two plastic layers 21a", 21b" each which are less than 0.03 inches or 0.75 inches or which form a composite layer and defines a major elevational portion 22" as illustrated in the other embodiments. These two plastic layers 21a", 21b", however, are also preferably positioned prior to the metallic layer or second layer 24". These plastic layers 21a", 21b" are preferably used for data encoding, focusing, and image enhancement, especially in the DVD format as understood by those skilled in the art, have smaller pits, and form two levels of digitally encoded data.

An opening 32 preferably extends through the first, second, third, and fourth layers 21, 24, 26, 28 in a medial portion thereof (see FIGS. 1-2B and 6-7). The trading card optical compact disc 20 preferably has a perforated opening cover 33 which preferably attaches along perforation lines to either the third or fourth layers 26, 28. The opening cover 33 is preferably packaged and shipped with the trading card optical compact disc 20 so that the purchaser or user of the card can detach or remove the opening cover 33 from the card 20 for positioning the card 20 onto the spindle S of a disc reader 15. The opening 32 preferably has a diameter of about 0.6 inches, i.e., about 15 mm, and is primarily used to mount the card 20 onto the spindle S of a disc reader 15.

As illustrated in FIGS. 2A-2B, 3-5, and 7-8, a trading card optical compact disc 20 of the present invention also preferably has trading card interface seating means 40, e.g., preferably provided by a trading card interface seat, integrally formed in at least the first layer 21 for seating the trading card 20 onto a loading tray T of a disc reader 15 so as to interface with only portions of the seating ring R and

not other portions of the seating ring R of the disc reader 15 and to read digital data stored thereon from the trading card optical compact disc 20. The trading card seating means 40 preferably includes at least the first plastic layer having a major elevational portion 22 having a first predetermined height and a minor elevational portion 23 having a second predetermined height. The first predetermined height preferably is about 0.05 inches. The major elevational portion 22 has the encoded digital data thereon, and the minor elevational portion 23 is preferably devoid of the encoded digital data. By the provision of the trading card interface seating means 40, the trading card optical compact disc 20 therefore advantageously does not require a separate special adapter for compatibility with existing disc readers. The positioning of and construction of the trading card interface seating means 40 also enables the disc 20 to balance and rotate effectively within a conventional disc reader 15.

The major elevational portion 22 is formed in a medial portion of the trading card 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extend generally linearly between each of the first pair of spaced-apart outer peripheries. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion 22 are centered about an axis A extending through the medial opening 32 and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries 38 (see also 38' of FIG. 2B and 38" of FIG. 7). A radius extending from a medial portion of the medial opening 32 to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion 22 is less than 1.6 inches.

As perhaps best illustrated in FIG. 2A, the encoded digital data of the major elevational portion 22 of the first layer 21 is formed within a circular data zone 34 (see also 34' of FIGS. 2B and 5 and 34" of FIG. 7) and preferably does not cover, i.e., is less than, the entire surface area of the major elevational portion 22 of the first layer 21. The circular data zone 34 has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches. The circular data zone 34 is preferably capable of storing between 60–70 Megabytes of digital information or digital data therein in some formats, e.g., audio or CD-ROM and capable of storing between 450–500 Megabytes of digital information in other formats, e.g., DVD. A first non-metallic zone 36 (see also 36' of FIGS. 2B and 5 and 36" of FIG. 7) surrounds and extends outwardly a predetermined distance from the medial opening 32. A second non-metallic zone 38 extends inwardly from the rectangular outer perimeter of the trading card optical compact disc 20 a predetermined distance. The first non-metallic zone 36 preferably includes a stacking ring 37 (see also 37' of FIGS. 2B and 5 and 37" of FIG. 7) surrounding the opening 32 for stacking another optical compact disc thereon such as used during mass production. It will be understood by those skilled in the art, however, that the stacking ring 37 is not necessary in the construction of the trading card optical compact disc 20 according to the present invention.

As illustrated in FIGS. 1–10, the present invention also advantageously provides methods of using and methods of forming a trading card optical compact disc 20 according to the present invention. As perhaps best illustrated in FIG. 9,

a method of using a trading card optical compact disc 20 to communicate digitally encoded data to a user of a disc reader 15 preferably includes positioning a trading card optical compact disc 20 having an opening 32 extending through a medial portion thereof onto a spindle S of a disc reader 15. The compact disc 20 preferably interfacingly seats onto only portions of a seating ring R and not other portions of the seating ring R of the disc reader 15. The trading card optical compact disc 20 can also be rotated so as to read digitally encoded data therefrom (see, e.g., FIG. 10).

A method of forming a trading card optical compact disc 20 according to the present invention preferably includes molding at least one plastic rectangular layer 21 having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. Prior to this molding step, however, and as understood by those skilled in the art, data for the disc 20 is optically, e.g., preferably by laser techniques, mastered from data files or other software programs. The master is then electroplated with a metal material, e.g., silver, and prepped for replicating positive mold copies or shims. Die stampers are produced from the electro-plated shims. The plastic layer 21 is then formed by injection molding from a negative image on a die stamper. Alternatively, as understood by those skilled in the art, two plastic layers 21a", 21b" can be formed as illustrated in FIG. 8 for DVD formats. The plastic layer 21 preferably includes a major elevational portion 22 having a first predetermined height and a minor elevational portion 23 having a second predetermined height. The major elevational portion 22 preferably has the encoded digital data thereon, and the minor elevational portion 23 is preferably devoid of the encoded digital data. These major and minor elevational portions 21, 24 and the digitally encoded data are preferably formatted and implemented in the optical mastering step.

The major elevational portion 22 is preferably formed in a medial portion of the trading card optical compact disc 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer peripheries. The encoded digital data of the major elevational portion 22 of the plastic layer 21 is preferably formed within a circular data zone 34 and comprises less than the entire surface area of the major elevational portion 22 of the plastic layer 21. The molding of the plastic layer 21 preferably includes molding an opening 34 extending through a medial portion of the plastic layer 21.

The method can also include applying a metallic layer 24 on at least portions of the plastic layer 21 and applying a third protective layer 26 on at least the metallic layer 24 for particularly protecting the metal material of the metallic layer 24. The metallic layer 24, for example, can be applied by metalizing the plastic layer 21 through a high speed spinning process or other metalizing processes known to those skilled in the art. The third layer 26 is preferably applied by pouring or spraying a curable liquid onto the second layer 24 in a controlled manner. The method can further include applying an indicia bearing layer 28 on the third layer 26. The indicia bearing layer 28 preferably has a generally planar upper surface for displaying indicia 29 therefrom. The formed disc 20 can then be packaged in a clam shell package, a custom package, or other compact disc package as understood by those skilled in the art. The present invention thereby advantageously provides a trading

card optical compact disc 20 and method of forming a trading card that stores and communicates trading card information to a user of a disc reader 15 in a manner that is relatively easy to manufacture in conjunction with known optical compact disc manufacturing techniques, e.g., an in-line production process, and thereby does not require extensive additional molding and tooling costs.

A method of forming a trading card optical compact disc 20 according to another embodiment of the present invention includes positioning a compact disc having a pattern of digital data encoded thereon onto a medial portion of a surface of a trading card having a width of about 2.5 inches and a length of about 3.5 inches. The combination of the compact disc and the trading card preferably have a major elevational portion and a minor elevational portion so that the major elevational portion interfacingly seats the combination onto a loading tray T of a disc reader 15 so as to interface with only portions of the seating ring, R and not other portions of the seating ring R of the disc reader 15 and to read digital data stored thereon from the trading card optical compact disc 20. The major elevational portion 22 has the encoded digital data thereon and the minor elevational portion 23 is preferably devoid of the encoded digital data. The major elevational portion 22 has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extends between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extends generally linearly between each of the first pair of spaced-apart outer peripheries. The major elevational portion 22 is formed in a medial portion of the trading card 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 20. Each of the first pair of space-apart outer side peripheries arcuately extending from each of the second pair of space-apart outer side peripheries. Also, each of the second pair of space-apart outer side peripheries extending generally linearly from each of the first pair of spaced-apart outer peripheries. The combination preferably includes an opening 32 formed in a medial portion thereof. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening 32 and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries. A radius extending from a medial portion of the medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is less than 1.6 inches.

Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope of the appended claims.

That which is claimed is:

1. A trading card optical compact disc compatible with a disc reader which includes a centrally located spindle and a recess in a loading tray thereof defining a seating ring for supporting and rotating a trading card optical compact disc positioned thereon, the trading card optical compact disc comprising;

at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon;

a second metallic layer formed on at least portions of the first plastic layer;

A third protective layer formed on at least the second layer for protecting the metallic layer;

an indicia bearing fourth layer formed on the third layer and having a generally planar upper surface for displaying indicia therefrom;

an opening extending through the first, second, third, and fourth layers in a medial portion thereof; and

trading card interface seating means integrally formed in at least the first layer for seating the trading card onto the loading tray of the disc reader so as to interface with only portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

2. A trading card optical compact disc as defined in claim 1, wherein said trading card seating means comprises at least said first plastic layer including a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height, the major elevational portion having the encoded digital data thereon and the minor elevational portion being devoid of the encoded digital data.

3. A trading card optical compact disc as defined in claim 2, wherein the major elevational portion is formed in a medial portion of the trading card and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion, each of the first pair of spaced-apart outer side peripheries arcuately extending between each of the second pair of spaced-apart outer side peripheries, and each of the second pair of spaced-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer peripheries.

4. A trading card optical compact disc as defined in claim 3, wherein each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of spaced-apart outer side peripheries, and wherein a radius extending from a medial portion of said medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is no more than 1.6 inches.

5. A trading card optical compact disc as defined in claim 3, wherein the encoded digital data of the major elevational portion of said first layer is formed within a circular data zone and comprises less than the entire surface area of the major elevational portion of said first layer.

6. A trading card optical compact disc as defined in claim 5, wherein the circular data zone has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches.

7. A trading card optical compact disc as defined in claim 1, wherein the plastic of said first layer comprises polycarbonate.

8. A trading card optical compact disc as defined in claim 1, further comprising a first non-metallic zone surrounding and extending outwardly a predetermined distance from the medial opening and a second non-metallic zone extending inwardly from a rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

9. A trading card optical compact disc as defined in claim 8, wherein the first non-metallic zone includes a stacking ring surrounding the opening for stacking another trading card optical compact disc thereon.

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10. A trading card optical compact disc compatible with a disc reader which includes a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon, the trading card optical compact disc comprising:

at least a first polycarbonate rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon, said first polycarbonate layer including a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height so that the major elevational portion interfacingly seats the trading card onto a loading tray of the disc reader so as to interface with only a portion of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc, the major elevational portion having the encoded digital data thereon and the minor elevational portion being devoid of the encoded digital data, the major elevational portion being formed in a medial portion of the trading card and having first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion, each of the first pair of spaced-apart outer side peripheries arcuately extending between each of the second pair of spaced-apart outer side peripheries, and each of the second pair of spaced-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer side peripheries;

30 a second metallic layer formed on at least portions of the first polycarbonate layer;

at least a third layer formed on at least the second layer for protecting the metallic layer and for displaying indicia therefrom; and

an opening extending through the first, second, and third layers in a medial portion thereof.

11. A trading card optical compact disc as defined in claim 10, wherein each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of spaced-apart outer side peripheries, and wherein a radius extending from a medial portion of said medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is no more than 1.6 inches.

12. A trading card optical compact disc as defined in claim 11, wherein the encoded digital data of the major elevational portion of said first layer is formed within a circular data zone and comprises less than the entire surface area of the major elevational portion of said first layer.

13. A trading card optical compact disc as defined in claim 12, wherein the circular data zone has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches.

14. A trading card optical compact disc as defined in claim 13, further comprising a first non-metallic zone surrounding and extending outwardly a predetermined distance from the medial opening and a second non-metallic zone extending inwardly from a rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

15. A trading card optical compact disc as defined in claim 14, wherein the first non-metallic zone includes a stacking ring surrounding the opening for stacking another trading card optical compact disc thereon.

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16. A trading card optical compact disc comprising:
at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches so as to define a rectangular outer perimeter and having a pattern of digital data encoded thereon, said first plastic layer including a major elevational portion and a minor elevational portion, the major elevational portion having the encoded digital data thereon and the minor elevational portion being devoid of the encoded digital data, the major elevational portion being formed in a medial portion of the trading card and having first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion, each of the first pair of spaced-apart outer side peripheries arcuately extending between each of the second pair of spaced-apart outer side peripheries, and each of the second pair of spaced-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer side peripheries;

a second metallic layer formed on at least portions of the first plastic layer;

at least a third layer formed on at least the second layer for protecting the metallic layer and for displaying indicia therefrom;

an opening extending through the first, second, and third layers in a medial portion thereof;

a first non-metallic zone surrounding and extending outwardly a predetermined distance from the medial opening; and

a second non-metallic zone extending inwardly from the rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

17. A trading card optical compact disc as defined in claim 16,

35 wherein each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries, and wherein a radius extending from a medial portion of said medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is no more than 1.6 inches.

18. A trading card optical compact disc as defined in claim 17,

45 wherein the encoded digital data of the major elevational portion of said first layer is formed within a circular data zone and comprises less than the entire surface area of the major elevational portion of said first layer.

19. A trading card optical compact disc as defined in claim 18,

50 wherein the circular data zone has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches.

20. A trading card optical compact disc as defined in claim 16,

55 wherein the first non-metallic zone includes a stacking ring surrounding the opening for stacking another trading card optical compact disc thereon.

21. A trading card optical compact disc having a width of about 2.5 inches and a length of about 3.5 inches, the trading card optical compact disc comprising:

at least a first plastic layer having a pattern of digital data encoded thereon, said first plastic layer including a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height, the major elevational portion having the encoded digital data thereon and the minor elevational portion being devoid of the encoded digital

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data, the major elevational portion being formed in a medial portion of the trading card and having first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion, each of the first pair of spaced-apart outer side peripheries arcuately extending between each of the second pair of spaced-apart outer side peripheries, and each of the second pair of spaced-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer side peripheries; a second metallic layer formed on at least portions of the first plastic layer;

at least a third layer formed on at least the second layer for displaying indicia therefrom;

an opening extending through the first, second, and third layers in a medial portion thereof;

a first non-metallic zone surrounding and extending outwardly a predetermined distance from the medial opening; and

a second non-metallic zone extending inwardly from a rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

22. A trading card optical compact disc as defined in claim **21**, wherein each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of spaced-apart outer side peripheries, and wherein a radius extending from a medial portion of said medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is no more than 1.6 inches.

23. A method of forming a trading card optical compact disc, the method comprising the step of molding at least one

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plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon, the at least one plastic layer having a major elevational portion and a minor elevational portion, the major elevational portion having the encoded digital data thereon and the minor elevational portion being devoid of the encoded digital data, the major elevational portion being formed in a medial portion of the trading card optical compact disc and having first and second airs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion, each of the first pair of spaced-apart outer side peripheries arcuately extending between each of the second pair of spaced-apart outer side peripheries, and each of the second pair of spaced-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer side peripheries applying a metallic layer on at least portions of the at least one plastic layer; and forming an indicia bearing layer overlying the at least one plastic layer and the metallic layer for bearing trading card indicia thereon.

24. A method as defined in claim **23**, wherein the encoded digital data of the major elevational portion of the plastic layer is formed within a circular data zone and comprises less than the entire surface area of the major elevational portion of the plastic layer.

25. A method as defined in claim **24**, wherein the step of molding the plastic layer includes molding an opening extending through a medial portion of the plastic layer.

26. A method as defined in claim **23**, further comprising the step of applying a protective layer on at least the metallic layer for protecting the metallic layer.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,982,736
DATED : November 9, 1999
INVENTOR(S) : PIERSON

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 12, line 39 Strike: "space-apart"
 Insert: - -spaced-apart- -

Column 14, line 10 Strike: "airs"
 Insert: - -pairs- -

Column 14, line 13 Strike: "paced-apart"
 Insert: - -spaced-apart- -

Signed and Sealed this
Twentieth Day of June, 2000

Attest:



Q. TODD DICKINSON

Attesting Officer

Director of Patents and Trademarks

EXHIBIT F



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(12) **United States Patent**
Pierson et al.

(10) Patent No.: US 6,304,544 B1
(45) Date of Patent: *Oct. 16, 2001

(54) CARD COMPACT DISC, COMPACT DISC INTERFACE SEAT AND METHODS OF USING SAME

0526/98 3/1998 (CH).

(List continued on next page.)

(75) Inventors: Gerald A. Pierson; Benjamin J. Everidge; Raymond K. Engelking, all of Orlando, FL (US)

(73) Assignee: Diskxpress US, Inc., Orlando, FL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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(22) Filed: Dec. 15, 1999

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(63) Continuation of application No. 09/292,285, filed on Apr. 15, 1999, now Pat. No. 6,078,557, which is a continuation of application No. 08/856,915, filed on May 15, 1997, now Pat. No. 5,982,736.

(51) Int. Cl.⁷ G11B 7/24

(52) U.S. Cl. 369/273; 369/286

(58) Field of Search 369/273, 272, 369/274, 281, 283, 286, 292, 77.1; 360/2, 135, 137

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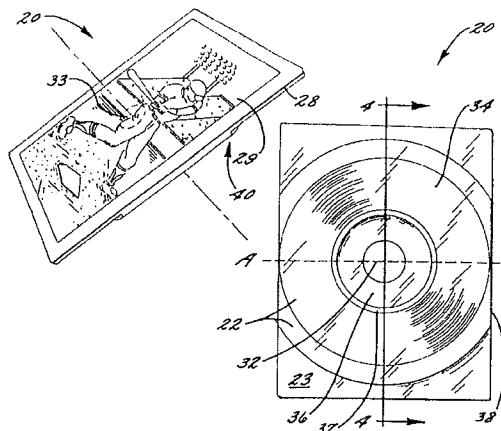
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ABSTRACT

A trading card optical compact disc and method of using and forming the compact disc are provided which are compatible with a disc reader having a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon. The trading card optical compact disc according to an embodiment of the invention preferably has at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. A second metallic layer is formed on at least portions of the first plastic layer, and a third protective layer is formed on at least the second layer for protecting the metallic layer. An indicia bearing fourth layer is formed on the third layer and has a generally planar upper surface for displaying indicia therefrom. An opening extends through the first, second, third, and fourth layers in a medial portion thereof. A trading card interface seat is preferably integrally formed in at least the first layer for seating the trading card onto a loading tray of a disc reader so as to interface with only portions of the seating ring of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

16 Claims, 3 Drawing Sheets



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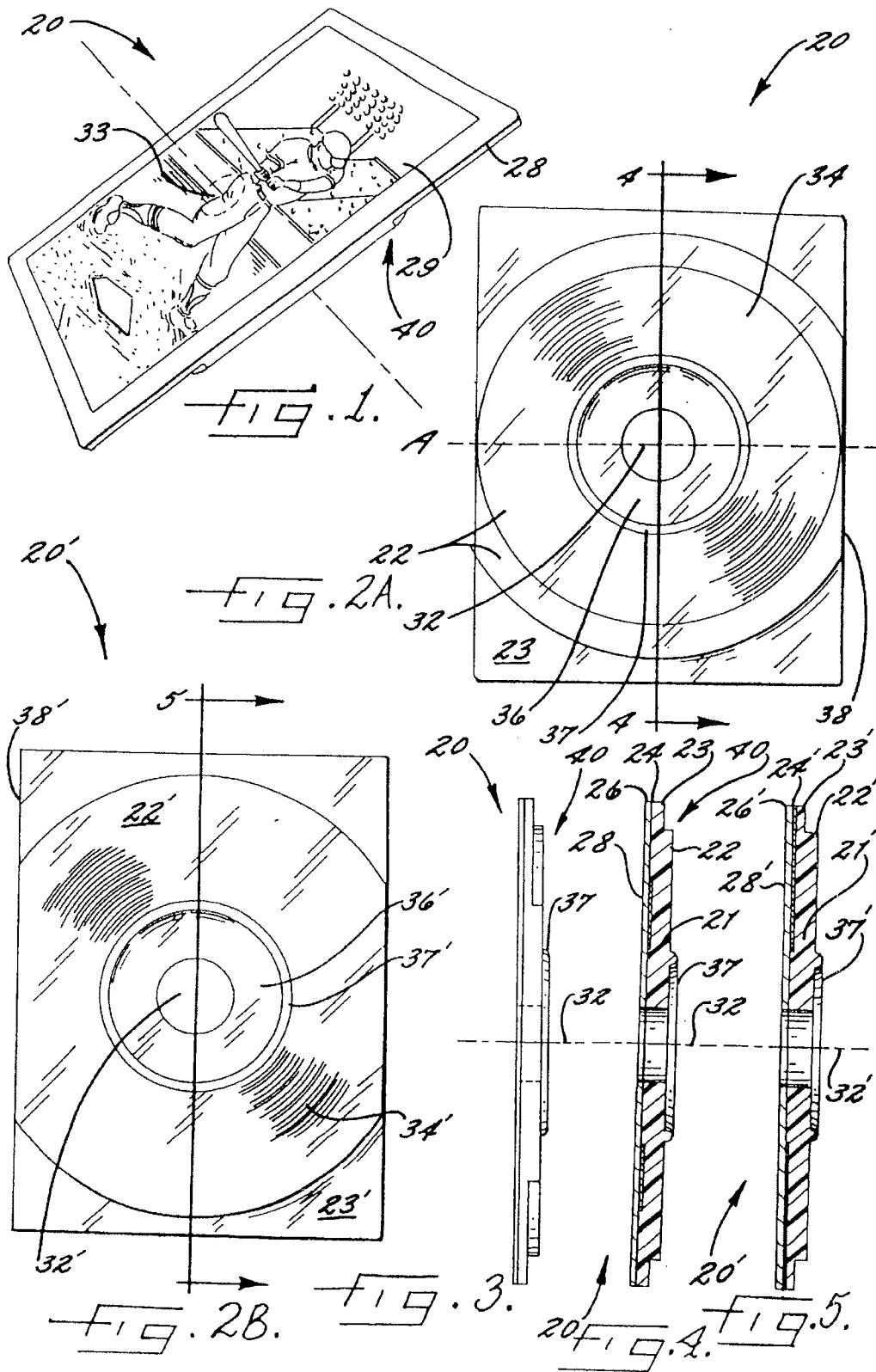
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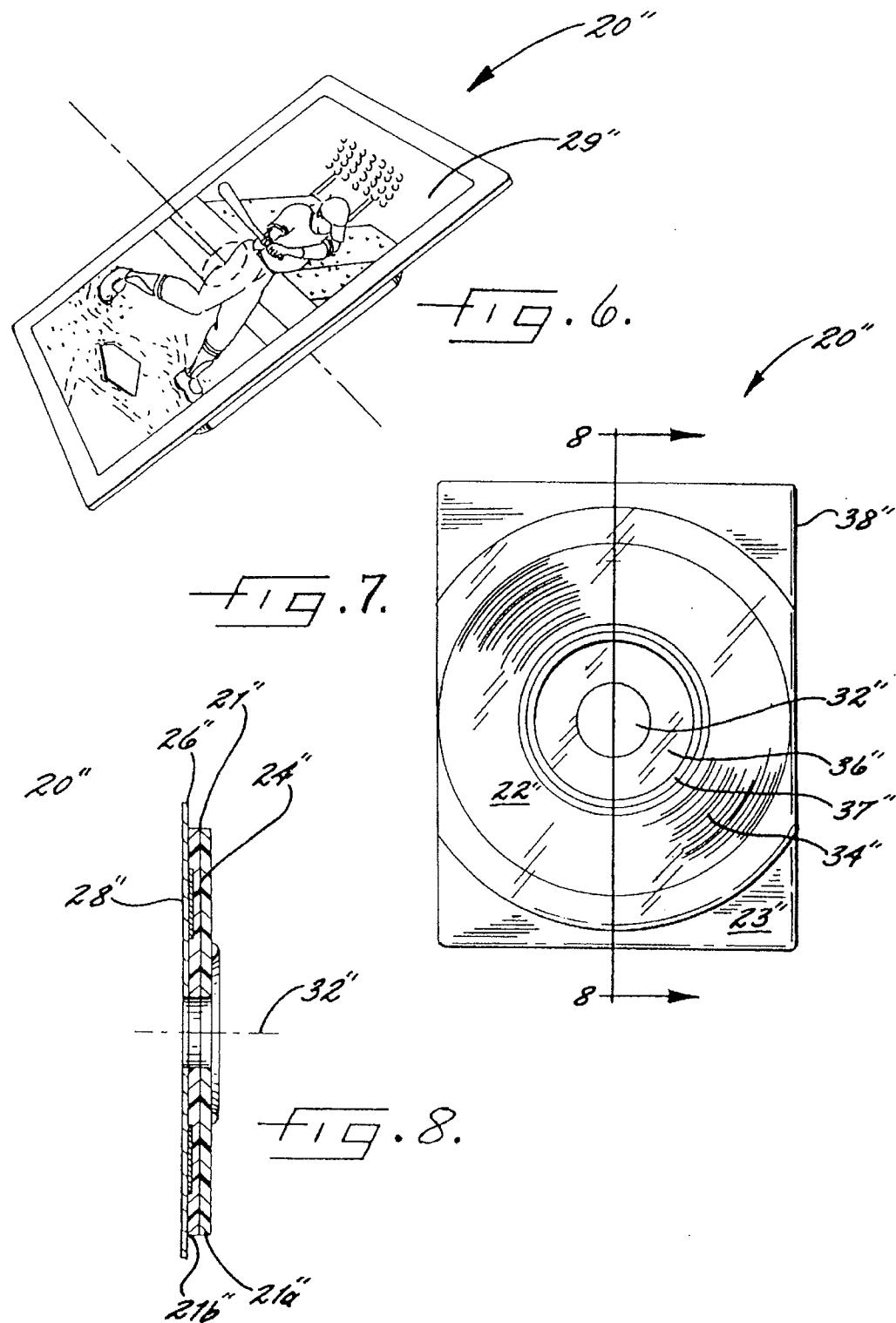


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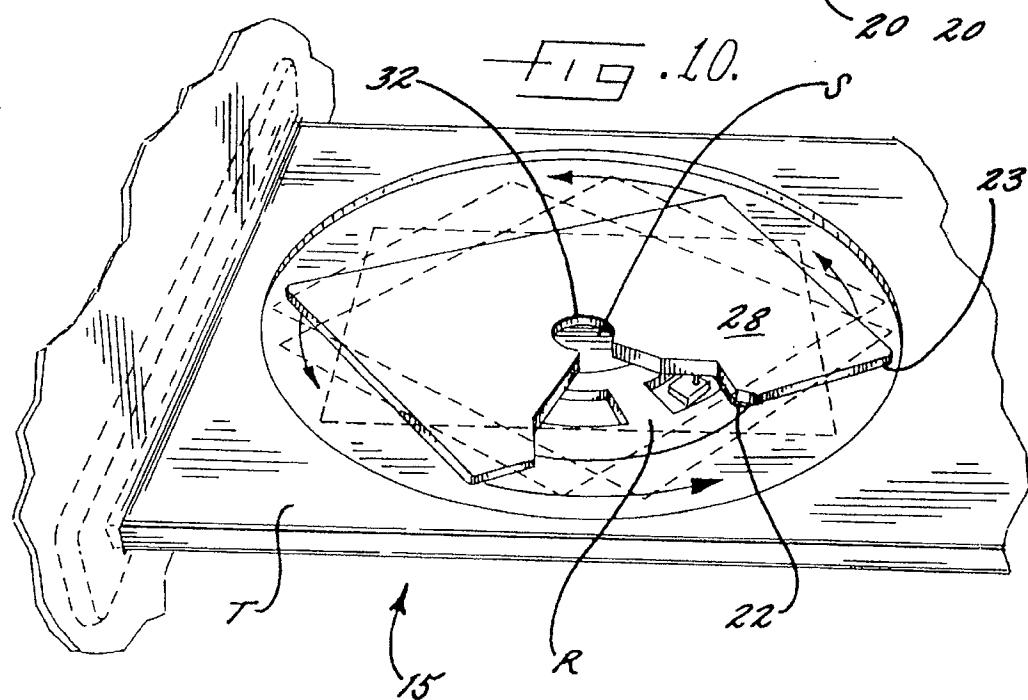
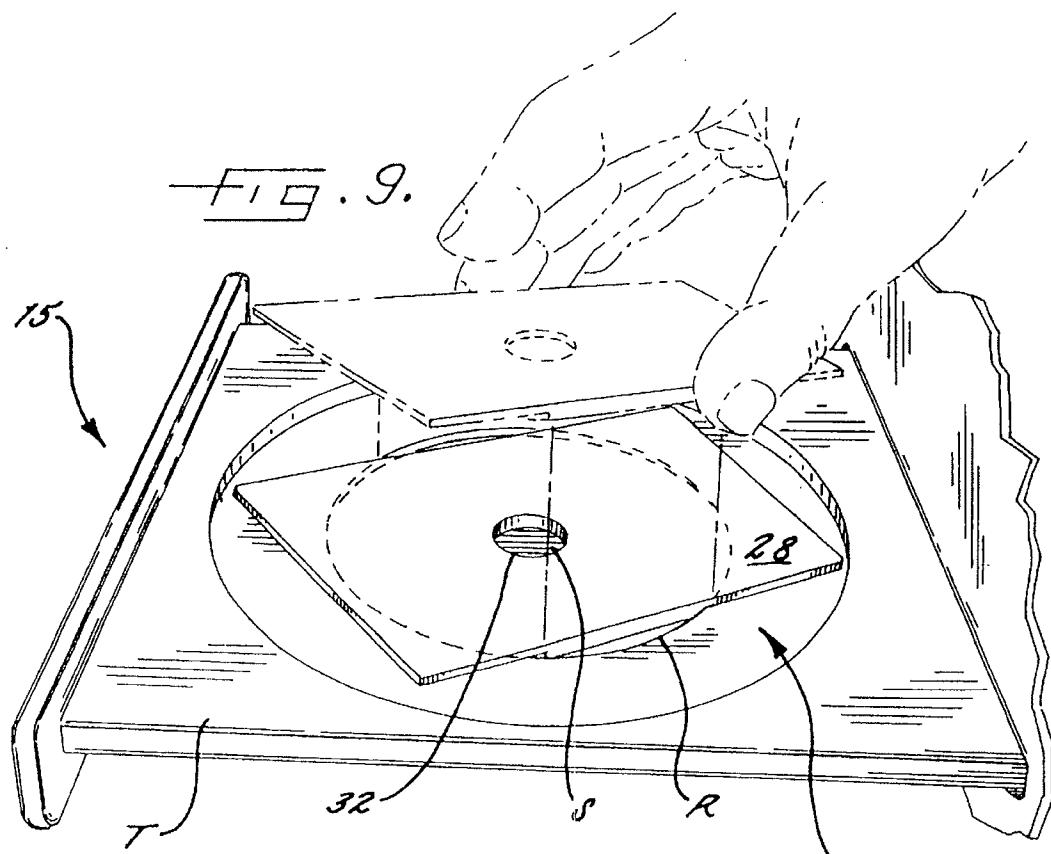


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CARD COMPACT DISC, COMPACT DISC INTERFACE SEAT AND METHODS OF USING SAME

This application is a continuation of Ser. No. 09/292,285 filed on Apr. 15, 1999, now U.S. Pat. No. 6,078,557 which is a continuation of Ser. No. 08/856,915 filed May 15, 1997 which is now U.S. Pat. No. 5,982,736 the disclosures of which are hereby incorporated by reference in their entirety.

FIELD OF THE INVENTION

This invention relates to novelty trading items and, more particularly, to novelty trading items for storing and communicating data to enthusiasts, hobbyists, and collectors.

BACKGROUND OF THE INVENTION

Over the years the trading card industry has developed as both a novelty item and a collectors item. As time goes by, the value of many of these trading cards which have printed indicia thereon has increased so that the trading card industry has grown significantly over the years and many trading cards have substantially increased in value. As technology has changed, however, various types of trading cards and methods of storing and communicating data have been developed.

The concept of associating card devices which store and communicate information to a user with indicia or an image thereon has been known for many years. Examples of such devices can be seen in U.S. Pat. No. 3,691,312 by Petersen titled "Tape Recording Apparatus And System Having A Very Thin Cassette," U.S. Pat. No. 4,904,853 by Yokokawa titled Dual-Function Information-Carrying Sheet Device," U.S. Pat. No. 5,411,259 by Pearson et al. titled "Video Sports Game System Using Trading Cards," and U.S. Pat. No. 5,433,035 by Bauer titled "Talking Entertainment Card." These prior card devices, however, either used older methods of storing and communicating information such as cassettes or used integrated circuit technology. Accordingly, these prior methods can be expensive and complex to manufacture even in large volumes and neither understood nor appreciated the benefits, capabilities, design, or construction of optical digital data storage devices, and more particularly optical compact discs. Only recently has the technology and concepts related to the use of optical digital data storage devices really increased and been accepted in the market so that the relative price of optical digital data storage media has decreased dramatically.

Conventional compact discs, for example, are conventionally fabricated in either 80 millimeter ("mm") or 120 mm sizes and are formed of generally rigid plastic discs. As understood by those skilled in the art, the discs are often formed by the use of a mold-based replication system using injection molding techniques. Each compact disc includes a series of either circular or spiral data tracks which are illuminated and read by a source of coherent light such as a laser. In producing these compact discs, data is optically mastered from data files and positive copies of the data are made. Die stampers are produced from electroplated shims, and discs are molded from the negative images on the die stampers. The discs are then individually metalized, and a lacquer coating is applied to each disc. The layer of rigid plastic positioned between each data track and the source of coherent light provides structural rigidity, protects the data tracks, and also functions as a single integral lens element to refract and focus the coherent light beam onto a selected data track. A disc label is also printed, and the disc inserted into a clam shell or other package for shipment to customers.

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Recently, however, other thin film digital data storage medium and methods of manufacturing digital data storage media have been developed including for use with trading cards. An example of this thin film digital data storage medium and related methods can be seen in U.S. Pat. No. 5,579,296 by Smith et al. titled "Optically Readable Thin Film Digital Data Storage Medium." These recently developed trading cards, however, require extensive and new manufacturing investments, require a special adaptor to make the trading cards compatible with compact disc playing systems, and can be inhibited by marketing and manufacturing constraints, including the additional special adaptor, which can make this recently developed technology less commercially feasible.

15 **SUMMARY OF THE INVENTION**

With the foregoing in mind, the present invention provides a trading card optical compact disc and methods of using a compact disc which are readily compatible with existing disc readers and relatively inexpensive to manufacture. The present invention also advantageously provides a trading card optical compact disc and method of forming a trading card that stores and communicates trading card information to a user of a disc reader in a manner that is relatively easy to manufacture in conjunction with known optical compact disc manufacturing techniques and thereby does not require extensive additional molding and tooling costs. The present invention further provides a trading card optical compact disc which does not require a separate special adapter for compatibility with existing disc readers.

More particularly, a trading card optical compact disc and method of using and forming the compact disc are provided which are compatible with a disc reader having a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon. The trading card optical compact disc according to a first embodiment of the present invention preferably has at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. A second metallic layer if formed on at least portions of the first plastic layer, and a third protective layer is formed on at least the second layer for protecting the metallic layer. An indicia bearing fourth layer is formed on the third layer and has a generally planar upper surface for displaying indicia therefrom. An opening extends through the first, second, third, and fourth layers in a medial portion thereof. Trading card interface seating means is preferably integrally formed in at least the first layer for seating the trading card onto a loading tray of a disc reader so as to interface with only portions of the seating ring and not other portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

According to the present invention, the trading card seating means is preferably provided by the at least a first plastic layer which has a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height. The major elevational portion has the encoded digital data thereon, and the minor elevational portion is preferably devoid of the encoded digital data. For alignment, balancing, and compatibility purposes, the major elevational portion is advantageously formed in a medial portion of the trading card and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair

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of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extend generally linearly between each of the first pair of spaced-apart outer peripheries. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries. The encoded digital data of the major elevational portion of the first layer is formed within a circular data zone and preferably does not cover, i.e., less than, the entire surface area of the major elevational portion of the first layer. The circular data zone has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches. The circular data zone is preferably capable of storing between 60–70 Megabytes of information or data therein in some compact disc formats, e.g., audio or CD-ROM, or 450–500 Megabytes in other compact disc formats, e.g., digital video. A first non-metallic zone surrounds and extends outwardly a predetermined distance from the medial opening, and a second non-metallic zone extends inwardly from the rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

By the provision of the trading card interface seating means, the trading card optical compact disc of the present invention advantageously allows a user thereof to readily position the disc into a conventional disc reader with any separate special attachments, adapters, or fasteners. The positioning of and construction of the trading card interface seating means also enables the disc to balance and rotate effectively within a conventional disc reader. By not requiring a separate adapter, the trading card optical compact disc advantageously can be easier to use and, in some embodiments, easier and less expensive to manufacture.

A method of using a trading card optical compact disc to communicate digitally encoded data to a user of an optical disc reader is also provided according to the present invention. The method preferably includes positioning a trading card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of a disc reader so that the compact disc interfacingly seats onto only portions of a seating ring and not other portions of the seating ring of the disc reader.

Additionally, methods of forming a trading card optical compact disc are provided according to the present invention. A method preferably includes molding at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. The at least a first plastic layer preferably includes a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height. The major elevational portion has the encoded digital data thereon and the minor elevational portion is devoid of the encoded digital data.

Another method of forming a trading card optical disc preferably includes positioning a compact disc having a pattern of digital data encoded thereon onto a medial portion of a surface of a trading card having a width of about 2.5 inches and a length of about 3.5 inches, the combination of the compact disc and the trading card having a major elevational portion and a minor elevational portion so that the major elevational portion interfacingly seats the combination onto a loading tray of a disc reader so as to interface with only portions of the seating ring and not other portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

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The major elevational portion has the encoded digital data thereon, and the minor elevational portion is preferably devoid of the encoded digital data. The major elevational portion has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion. Each of the first pair of space-apart outer side peripheries arcuately extends between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extends generally linearly between each of the first pair of spaced-apart outer peripheries.

Because the trading card optical compact disc and associated methods were conceived and developed while keeping in mind the commercial viability and ease of manufacturing, the trading card optical compact disc is preferably formed using conventional compact disc manufacturing techniques. This, for example, advantageously allows training, tooling, and other associated manufacturing costs to be reduced and advantageously provides incentives for manufacturers to more readily accept the technology for manufacturing purposes. In contrast to other known concepts, by providing incentives to make this technology readily manufacturable by existing compact disc manufacturers, the present invention achieves a significant goal in reducing the overall price of the end product to ultimate purchasers.

BRIEF DESCRIPTION OF THE DRAWINGS

Some of the features, advantages, and benefits of the present invention having been stated, others will become apparent as the description proceeds when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of trading card optical compact disc according to the present invention;

FIG. 2A is a bottom plan view of a trading card optical compact disc according to a first embodiment of the present invention;

FIG. 2B is a bottom plan view of a trading card optical compact disc according to a second embodiment of the present invention;

FIG. 3 is a side elevational view of a trading card optical compact disc according to a first embodiment of the present invention;

FIG. 4 is a vertical sectional view of a trading card optical compact disc according to taken along line 4—4 for FIG. 2A according to a first embodiment of the present invention;

FIG. 5 is a vertical sectional view of a trading card optical compact disc taken along line 5—5 of FIG. 2B according to a second embodiment of the present invention;

FIG. 6 is a perspective view of a trading card optical compact disc according to the third embodiment of the present invention;

FIG. 7 is a bottom plan view of a trading card optical compact disc according to the third embodiment of the present invention;

FIG. 8 is a vertical sectional view of a trading card optical compact disc taken along the line 8—8 of FIG. 7 according to the third embodiment of the invention;

FIG. 9 is a perspective view of a trading card optical compact disc being positioned into a disc reader according to a first embodiment of the present invention; and

FIG. 10 is a fragmentary perspective view of a trading card optical disc positioned in a disc reader and being rotated for reading digital data therefrom.

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DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout, and prime and double prime notation are used to indicate similar elements in alternative embodiments.

FIG. 1 illustrates a perspective view of a trading card optical compact disc 20 according to an embodiment of the present invention. The trading card optical compact disc 20 is preferably compatible with a disc reader 15 (see FIGS. 9-10) which includes a centrally located spindle S and a seating ring R of a loading tray T for supporting and rotating a compact disc ("CD") positioned thereon. The trading card optical compact disc 20 has at least a first plastic rectangular layer 21 having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon, i.e., pits and tracks as understood by those skilled in the art. The plastic of the first layer 21 is preferably a polycarbonate material or other optically transparent embossable plastic material as understood by those skilled in the art.

Various formats or data categories, including compact disc audio data, digital video disc ("DVD"), and/or compact disc read-only-memory ("ROM") data can be embossed into and stored on the first layer 21 by techniques known to those skilled in the art. For trading card applications (see FIG. 1), for example, digital data including visual information of photographs, video, textual information such as a person's or team's statistics and biographies, historical information, music, narration, and other data can be stored and recalled at will by a user of a disc reader 15. As understood by those skilled in the art, these trading card applications, for example, can include sports, music, entertainment, publishing, book, magazine, topical information, or various other types and formats of trading cards.

A conventional compact disc reader 15, for example, can include a loading tray T having a centrally located spindle S and a seating ring R for supporting and rotating a compact disc having planar upper and lower surfaces and embedded data tracks consisting of the encoded digital data. A compact disc reader 15 also has a digital data reading system which includes a source of light positioned for generating a light beam to illuminate the data tracks. A light beam is reflected from the data tracks and is modulated by the encoded digital data. A digital reading system of the compact disc reader 15 receives and converts a corresponding electrical signal for processing the read data, e.g., by a microprocessor-based decoding system.

Preferably, as illustrated in FIGS. 2A-2B, 3-5 and 8, a second metallic layer 24 is formed on at least portions of the first plastic layer 21, e.g., portions of or the entire major elevational portion 22 of the first plastic layer (see FIGS. 2A and 4). The metallic layer 24 preferably includes an aluminum material, such as conventionally used with forming optical compact discs, silver material, gold material, or other reflective metal material. The second layer 24 preferably provides a reflective surface for the light beam after it passes through the first optically transparent plastic layer 21 when attempting to read the digitally encoded data from the disc

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20. As illustrated in FIGS. 2B and 5, for ease of manufacturing and aesthetic purposes, a second embodiment of the trading card optical compact disc 20' illustrates that the second layer 24' can also extend substantially the full length and width of the trading card optical compact disc 20'. The second embodiment also includes a first layer 21', a major elevational portion 22', the second layer 24', a third layer 26', a fourth indicia bearing layer 28', and a medial opening 32' extending therethrough (see also opening 32" of FIG. 8) as illustrated. In either the first or second embodiments of the trading card optical compact disc 20, 20', however, a non-metallic zone (see also indicia 29" of FIG. 6) is preferably formed around the entire peripheries of the trading card optical compact disc 20, 20'.

Additionally, a third protective layer 26 is preferably formed on at least the second layer 24 for protecting the metallic layer 24 such as from chipping, flaking, or other damage. The third layer 26 is preferably a lacquer material or other thin hard coat material which is formed on the first and second layers 21, 24 to enhance the scratch resistance and provide other protection for these layers 21, 24. A fourth indicia bearing layer 28 is preferably formed on the third layer 26 and has a generally planar upper surface for displaying indicia 29 therefrom. The indicia 29 is preferably a photograph, sketch, textual information, or other images formed by ink or other material formed or positioned onto either the lacquer layer or formed by another material, e.g., paper or plastic, formed on or adhered to the lacquer layer 26. Also, for example, if the indicia bearing layer is a paper material adhered to the lacquer layer 26, then an adhesive is preferably positioned therebetween. The thickness of the combination of the first, second, third, and fourth layers 21, 24, 26, 28 of the first and second embodiments is preferably less than about 0.06 inches or 1.5 mm.

As best shown in FIGS. 6-8, the thickness of the combination of the first, second, third, and fourth layers 21", 24", 26", 28" of the third embodiment of a trading card optical compact disc 20", e.g., a DVD format, which preferably uses a digital video data format is also preferably less than about 0.06 inches or 1.5 mm. This embodiment, as understood by those skilled in the art, preferably has at least two plastic layers 21a", 21b" each which are less than 0.03 inches or 0.75 inches or which form a composite layer as illustrated in the other embodiments. These two plastic layers 21a", 21b", however, are also preferably positioned prior to the metallic layer or second layer 24". These plastic layers 21a", 21b" are preferably used for data encoding, focusing, and image enhancement, especially in the DVD format as understood by those skilled in the art, have smaller pits, and form two levels of digitally encoded data.

An opening 32 preferably extends through the first, second, third, and fourth layers 21, 24, 26, 28 in a medial portion thereof (see FIGS. 1-2B and 6-7). The trading card optical compact disc 20 preferably has a perforated opening cover 33 which preferably attaches along perforation lines to either the third or fourth layers 26, 28. The opening cover 33 is preferably packaged and shipped with the trading card optical compact disc 20 so that the purchaser or user of the card can detach or remove the opening cover 33 from the card 20 for positioning the card 20 onto the spindle S of a disc reader 15. The opening 32 preferably has a diameter of about 0.6 inches, i.e., about 15 mm, and is primarily used to mount the card 20 onto the spindle S of a disc reader 15.

As illustrated in FIGS. 2A-2B, 3-5, and 7-8, a trading card optical compact disc 20 of the present invention also preferably has trading card interface seating means 40, e.g., preferably provided by a trading card interface seat, integrally formed in at least the first layer 21 for seating the

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trading card 20 onto a loading tray T of a disc reader 15 so as to interface with only portions of the seating ring R and not other portions of the seating ring R of the disc reader 15 and to read digital data stored thereon from the trading card optical compact disc 20. The trading card seating means 40 preferably includes at least the first plastic layer having a major elevational portion 22 having a first predetermined height and a minor elevational portion 23 having a second predetermined height. The first predetermined height preferably is about 0.05 inches. The major elevational portion 22 has the encoded digital data thereon, and the minor elevational portion 23 is preferably devoid of the encoded digital data. By the provision of the trading card interface seating means 40, the trading card optical compact disc 20 therefore advantageously does not require a separate special adapter for compatibility with existing disc readers. The positioning of and construction of the trading card interface seating means 40 also enables the disc 20 to balance and rotate effectively within a conventional disc reader 15.

The major elevational portion 22 is formed in a medial portion of the trading card 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extend generally linearly between each of the first pair of spaced-apart outer peripheries. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion 22 are centered about an axis A extending through the medial opening 32 and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries 38 (see also 38' of FIG. 2B and 38" of FIG. 7). A radius extending from a medial portion of the medial opening 32 to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion 22 is less than 1.6 inches.

As perhaps best illustrated in FIG. 2A, the encoded digital data of the major elevational portion 22 of the first layer 21 is formed within a circular data zone 34 (see also 34' of FIGS. 2B and 5 and 34" of FIG. 7) and preferably does not cover, i.e., is less than, the entire surface area of the major elevational portion 22 of the first layer 21. The circular data zone 34 has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches. The circular data zone 34 is preferably capable of storing between 60-70 Megabytes of digital information or digital data therein in some formats, e.g., audio or CD-ROM and capable of storing between 450-500 Megabytes of digital information in other formats, c.g., DVD. A first nonmetallic zone 36 (see also 36' of FIGS. 2B and 5 and 36" of FIG. 7) surrounds and extends outwardly a predetermined distance from the medial opening 32. A second non-metallic zone 38 extends inwardly from the rectangular outer perimeter of the trading card optical compact disc 20 a predetermined distance. The first non-metallic zone 36 preferably includes a stacking ring 37 (see also 37' of FIGS. 2B and 5 and 37" of FIG. 7) surrounding the opening 32 for stacking another optical compact disc thereon such as used during mass production. It will be understood by those skilled in the art, however, that the stacking ring 37 is not necessary in the construction of the trading card optical compact disc 20 according to the present invention.

As illustrated in FIGS. 1-10, the present invention also advantageously provides methods of using and methods of

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forming a trading card optical compact disc 20 according to the present invention. As perhaps best illustrated in FIG. 9, a method of using a trading card optical compact disc 20 to communicate digitally encoded data to a user of a disc reader 15 preferably includes positioning a trading card optical compact disc 20 having an opening 32 extending through a medial portion thereof onto a spindle S of a disc reader 15. The compact disc 20 preferably interfacingly seats onto only portions of a seating ring R and not other portions of the seating ring R of the disc reader 15. The trading card optical compact disc 20 can also be rotated so as to read digitally encoded data therefrom (see, e.g., FIG. 10).

A method of forming a trading card optical compact disc 20 according to the present invention preferably includes molding at least one plastic rectangular layer 21 having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. Prior to this molding step, however, and as understood by those skilled in the art, data for the disc 20 is optically, e.g., preferably by laser techniques, mastered from data files or other software programs. The master is then electroplated with a metal material, e.g., silver, and prepped for replicating positive mold copies or shims. Die stampers are produced from the electroplated shims. The plastic layer 21 is then formed by injection molding from a negative image on a die stamper. Alternatively, as understood by those skilled in the art, two plastic layers 21a", 21b" can be formed as illustrated in FIG. 8 for DVD formats. The plastic layer 21 preferably includes a major elevational portion 22 having a first predetermined height and a minor elevational portion 23 having a second predetermined height. The major elevational portion 22 preferably has the encoded digital data thereon, and the minor elevational portion 23 is preferably devoid of the encoded digital data. These major and minor elevational portions 21, 24 and the digitally encoded data are preferably formatted and implemented in the optical mastering step.

The major elevational portion 22 is preferably formed in a medial portion of the trading card optical compact disc 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer peripheries. The encoded digital data of the major elevational portion 22 of the plastic layer 21 is preferably formed within a circular data zone 34 and comprises less than the entire surface area of the major elevational portion 22 of the plastic layer 21. The molding of the plastic layer 21 preferably includes molding an opening 34 extending through a medial portion of the plastic layer 21.

The method can also include applying a metallic layer 24 on at least portions of the plastic layer 21 and applying a third protective layer 26 on at least the metallic layer 24 for particularly protecting the metal material of the metallic layer 24. The metallic layer 24, for example, can be applied by metalizing the plastic layer 21 through a high speed spinning process or other metalizing processes known to those skilled in the art. The third layer 26 is preferably applied by pouring or spraying a curable liquid onto the second layer 24 in a controlled manner. The method can further include applying an indicia bearing layer 28 on the third layer 26. The indicia bearing layer 28 preferably has a generally planar upper surface for displaying indicia 29 therefrom. The formed disc 20 can then be packaged in a clam shell package, a custom package, or other compact disc

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package as understood by those skilled in the art. The present invention thereby advantageously provides a trading card optical compact disc 20 and method of forming a trading card that stores and communicates trading card information to a user of a disc reader 15 in a manner that is relatively easy to manufacture in conjunction with known optical compact disc manufacturing techniques, e.g., an in-line production process, and thereby does not require extensive additional molding and tooling costs.

A method of forming a trading card optical compact disc 20 according to another embodiment of the present invention includes positioning a compact disc having a pattern of digital data encoded thereon onto a medial portion of a surface of a trading card having a width of about 2.5 inches and a length of about 3.5 inches. The combination of the compact disc and the trading card preferably have a major elevational portion and a minor elevational portion so that the major elevational portion interfacingly seats the combination onto a loading tray T of a disc reader 15 so as to interface with only portions of the seating ring R and not other portions of the seating ring R of the disc reader 15 and to read digital data stored thereon from the trading card optical compact disc 20. The major elevational portion 22 has the encoded digital data thereon and the minor elevational portion 23 is preferably devoid of the encoded digital data. The major elevational portion 22 has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extends between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extends generally linearly between each of the first pair of spaced-apart outer peripheries. The major elevational portion 22 is formed in a medial portion of the trading card 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 20. Each of the first pair of space-apart outer side peripheries arcuately extending from each of the second pair of space-apart outer side peripheries. Also, each of the second pair of space-apart outer side peripheries extending generally linearly from each of the first pair of spaced-apart outer peripheries. The combination preferably includes an opening 32 formed in a medial portion thereof. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening 32 and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries. A radius extending from a medial portion of the medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is less than 1.6 inches.

Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope of the appended claims.

That which is claimed is:

1. A card optical compact disc compatible with a disc reader which includes a loading tray having an inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring for supporting the card optical compact disc when positioned thereon, the card optical compact disc comprising:

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at least a first layer having a pattern of digital data encoded thereon;

at least a second indicia bearing layer overlying the first layer, having a substantially planar and substantially rectangular-shaped upper surface for displaying indicia therefrom, and having portions thereof extending outwardly beyond the peripheries of the inner annular-shaped recess when the card optical compact disc is positioned in the disc reader; and

card interface seating means associated with at least the first layer of the card optical compact disc for seating the card onto the loading tray of the disc reader so as to interfacingly abut with only portions of a periphery of the inner optical compact disc seating ring of the disc reader and not the entire periphery of the inner optical compact disc seating ring.

2. A card optical compact disc compatible with a disc reader which includes a loading tray having an inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring for supporting Zth card optical compact disc when positioned thereon, the card optical compact disc comprising:

at least a first layer having a pattern of digital data encoded thereon;

at least a second layer overlying the first layer, having a substantially planar and substantially rectangular upper surface, and having portions thereof extending outwardly beyond the peripheries of the inner annular-shaped recess when the card optical compact disc is positioned in the disc reader; and

card interface seating means associated with the first layer of the card optical compact disc for seating the card onto the loading tray of the disc reader so as to abuttingly interface with only portions of a periphery of the inner optical compact disc seating ring and not the entire periphery of the inner optical compact disc seating ring of the disc reader.

3. A card optical compact disc as defined in claim 2, wherein the card interface seating means further has at least two substantially arcuate and spaced-apart outer peripheries.

4. A card optical compact disc as defined in claim 3, wherein the card interface seating means further has at least two substantially linear extending outer peripheries extending between the arcuate outer peripheries, the linear outer peripheries not abuttingly interfacing with, and being secant to, the periphery of the seating ring.

5. A card optical compact disc comprising:

at least two layers of material having an opening extending through a medial portion thereof, at least one of the two layers having an outer periphery with a substantially rectangular shape; and

card interface seating means associated with at least one layer of material of the card optical compact disc for seating the card onto a loading tray of a disc reader so as to abuttingly interface with only portions of a periphery, and not the entire periphery, of an inner annular-shaped recess in the loading tray, the loading tray having the inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner compact disc seating ring and wherein portions of the substantially rectangular-shaped outer periphery extend beyond the outer periphery of the inner compact disc seating ring when the card optical compact disc is positioned in the loading tray.

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6. A method of using a card optical compact disc having an periphery with a substantially rectangular shp to communicate digitally encoded data to a user of an optical disc reader, the method comprising positioning the card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of a disc reader so that the compact disc when positioned in an inner annular-shaped recess of the loading tray abuts only portions of a periphery of the inner annular-shaped recess, and not the entire periphery, of the inner annular-shaped recess, the loading tray having the inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring positioned adjacent the disc reader and wherein portions of the substantially rectangular shaped outer peripheries of the card optical compact disc extend beyond the outer periphery of the inner optical compact disc seating ring when the card optical compact disc is positioned in the loading tray, and rotating the card optical compact disc so as to read the digitally encoded data therefrom.

7. A card optical compact disc compatible with a disc reader which includes a loading tray having an inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring for supporting the card optical compact disc when positioned thereon, the card optical compact disc comprising:

at least a first layer having a pattern of digital data encoded thereon;
 at least a second layer overlying the first layer, having a substantially planar and substantially rectangular upper surface, and having portions thereof extending outwardly beyond the periphery of the inner annular-shaped recessed when positioned in the disc reader; and
 a card interface seat associated with the first layer of the card optical compact disc to seat the card onto the loading tray of the disc reader when positioned therein so as to abuttingly interfacc with only portions of a periphery of the inner optical compact disc seating ring, and not the entire periphery, of the inner optical compact disc seating ring of the disc reader.

8. A card optical compact disc as defined in claim 7, wherein the card interface seat has at least two substantially arcuate and spaced-apart outer periphery portions.

9. An optical compact disc interface seat compatible with a disc reader which includes a loading tray having an inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring for supporting the optical compact disc interface seat when positioned thereon, the optical compact disc interface seat comprising:

at least a first layer having a pattern of digital data encoded thereon; and
 at least a second layer overlying the first layer and having a substantially planar upper surface,
 wherein an outer periphery of the layer thereof has at least two substantially arcuate and spaced-apart outer periphery portions and at least two substantially linear extending outer periphery portions connected to the arcuate outer periphery portions, the linear outer periphery portions not abuttingly interfacing with, and being secant to, the periphery of the seating ring when positioned therein.

10. An optical compact disc interface seat as defined in claim 8, wherein the second layer is an indicia bearing layer.

11. A card optical compact disc adapted to be used with a disc reader which includes a loading tray having an inner

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annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring for supporting the card optical compact disc when positioned thereon, the card optical compact disc comprising:

at least a first layer having a pattern of digital data encoded thereon;
 at least a second layer overlying the first layer and having a substantially planar upper surface; and
 a card interface seat associated with the first layer of the card optical compact disc to seat the card onto the loading tray of the disc reader when positioned therein so as to abuttingly interface with only portions of the periphery of the inner optical compact disc seating ring, and not the entire periphery, the inner optical compact disc seating ring of the disc reader.

12. A method of using a card optical compact disc to communicate digitally encoded data to a user of an optical disc reader, the method comprising positioning the card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of the disc reader, the card optical compact disc having a card interface seat having a first pair of spaced-apart and substantially parallel linear outer periphery portions and a second pair of spaced-apart and substantially arcuate outer periphery portions each connected to and extending between the first pair of outer periphery portions and rotating the card optical compact disc so to read digitally encoded data therefrom.

13. An optical compact disc interface seat comprising:
 at least a first layer having a pattern of digital data encoded thereon; and
 at least a second layer overlying the first layer and having a substantially planar upper surface, and
 wherein an outer periphery of the first layer thereof has a pair of substantially arcuate and spaced-apart outer periphery portions and a pair of substantially linear extending outer periphery portions each connected to and extending between the substantially arcuate outer periphery portions, the pair of substantially linear periphery portions also extending substantially parallel to each other.

14. An optical compact disc interface seat as defined in claim 13, wherein the second layer is an indicia bearing layer.

15. A card optical compact disc comprising:
 at least a first layer having a pattern of digital data encoded thereon;
 at least a second layer overlying the first layer and having a substantially planar upper surface;
 an opening extending through a medial portion of the first and second layers; and
 a card interface seat associated with the first layer of the card optical compact disc to seat the card onto a loading tray of a disc reader when positioned therein, the card interface seat having a first pair of spaced-apart and substantially parallel and generally linearly-extending outer periphery prtion and a second pair of spaced-apart and arcuately-extending outer periphery portions each connected to and extending between the first pair of outer periphery portions.

16. A card optical compact disc as defined in claim 15, wherein a radius extending from a center point of the opening to each of the arcuately-extending second pair of spaced-apart outer periphery portions is less than 1.6 inches.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,304,544 B1
DATED : October 16, 2001
INVENTOR(S) : Pierson et al.

Page 1 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page.

ABSTRACT, line 20, please delete "ring of the seating ring" and insert -- ring and not other portion of the seating ring -- therefor.

Column 1.

Lines 30-31, please delete " "Tape Recording Apparatus And System Having A Very Thin Cassette," " and insert -- "*Tape Recording Apparatus And System Having A Very Thin Cassette,*" -- therefor.

Line 31, please delete "Dual-Function Information-Carrying Sheet Device," " and insert -- "*Dual-Function Information-Carrying Sheet Device,*" -- therefor.

Column 2.

Lines 6-7, please delete " "Optically Readable Thin Film Digital Data Storage Medium." " and insert -- "*Optically Readable Thin Film Digital Data Storage Medium.*" -- therefor.

Line 40, please delete "if" and insert -- is -- therefor.

Line 66, please delete "space-apart" and insert -- spaced-apart -- therefor.

Column 3.

Lines 2 and 8, please delete "space-apart" and insert -- spaced-apart -- therefor.

Line 34, please delete "is" and insert -- in -- therefor.

Column 4.

Lines 6, 8 and 9, please delete "space-apart" and insert -- spaced-apart -- therefor.

Line 34, between "of" and "trading", please insert -- a --.

Line 46, please delete "according to".

Line 46, please delete for and insert -- of -- therefor.

Line 59, between "along" and "line", please delete "the".

Column 5.

Line 39, please delete "be" and insert -- by -- therefor.

Column 7.

Lines 24, 25, 26 and 33, please delete "space-apart" and insert -- spaced-apart -- therefor.

Column 8.

Lines 41, 43 and 44, please delete "space-apart" and insert -- spaced-apart -- therefor.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,304,544 B1
DATED : October 16, 2001
INVENTOR(S) : Pierson et al.

Page 2 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 9,

Lines 29, 30, 31, 37, 39, 40 and 48, please delete "space-apart" and insert -- spaced-apart -- therefor.

Column 10,

Line 7, between "peripheries" and "the", please delete "a" and insert -- of -- therefor.

Line 21, please delete "Zth" and insert -- the -- therefor.

Line 30, please delete "shaed" and insert -- shaped -- therefor.

Line 40, please delete "nterface" and insert -- interface -- therefor.

Line 50, please delete "leat" and insert -- least -- therefor.

Line 64, before "outer", please delete "an".

Column 11,

Line 2, between "an" and "periphery", please insert -- outer --.

Line 2, please delete "shp" and insert -- shape -- therefor.

Line 34, please delete "recessed" and insert -- recess -- therefor.

Line 60, please delete "perphery" and insert -- periphery -- therefor.

Column 12,

Line 15, please delete "periphery, the" and insert -- periphery of the -- therefor.

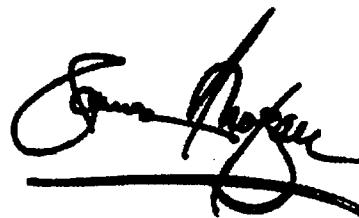
Line 58, please delete "prtion" and insert -- portions -- therefor.

Signed and Sealed this

Twenty-eighth Day of May, 2002

Attest:

Attesting Officer



JAMES E. ROGAN

Director of the United States Patent and Trademark Office

EXHIBIT G



US006078557A

United States Patent [19]
Pierson

[11] **Patent Number:** **6,078,557**
[45] **Date of Patent:** ***Jun. 20, 2000**

[54] **METHOD OF USING OPTICAL COMPACT DISC**

[76] Inventor: **Gerald A. Pierson**, 9931 Rivercrest Ct., Orlando, Fla. 32825

[*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/292,285**

[22] Filed: **Apr. 15, 1999**

Related U.S. Application Data

[63] Continuation of application No. 08/856,915, May 15, 1997, Pat. No. 5,982,736.

[51] **Int. Cl.⁷** **G11B 7/24**

[52] **U.S. Cl.** **369/273; 369/77.1**

[58] **Field of Search** **369/272, 273, 369/274, 280, 283, 286, 292, 77.1; 360/2**

[56] **References Cited**

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Tyler Gray, Shape of CD's to Come, May 28, 1997 Orlando Sentinel, Business Section, p. B-1 and B-4; Article refers to Shape CD Inc.

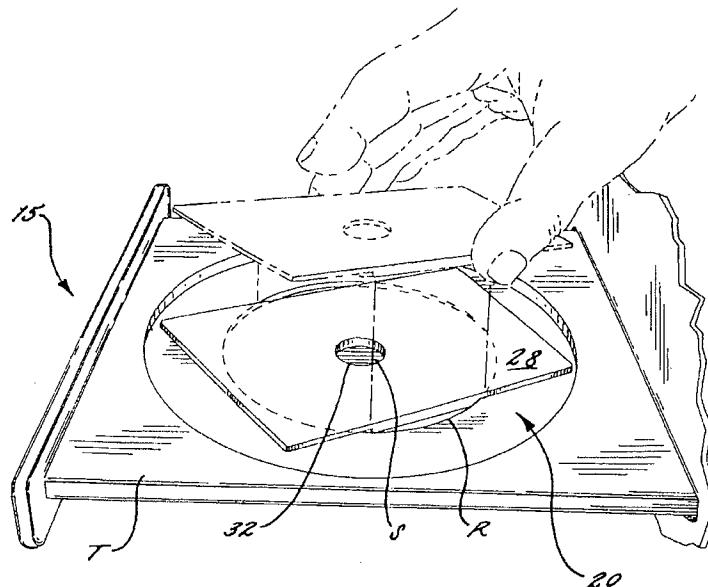
Primary Examiner—William R. Korzuch
Attorney, Agent, or Firm—Allen, Dyer, Doppelt, Milbrath & Gilchrist, P.A.

[57]

ABSTRACT

A trading card optical compact disc and method of using and forming the compact disc are provided which are compatible with a disc reader having a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon. The trading card optical compact disc according to an embodiment of the invention preferably has at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. A second metallic layer is formed on at least portions of the first plastic layer, and a third protective layer is formed on at least the second layer for protecting the metallic layer. An indicia bearing fourth layer is formed on the third layer and has a generally planar upper surface for displaying indicia therefrom. An opening extends through the first, second, third, and fourth layers in a medial portion thereof. A trading card interface seat is preferably integrally formed in at least the first layer for seating the trading card onto a loading tray of a disc reader so as to interface with only portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

3 Claims, 3 Drawing Sheets

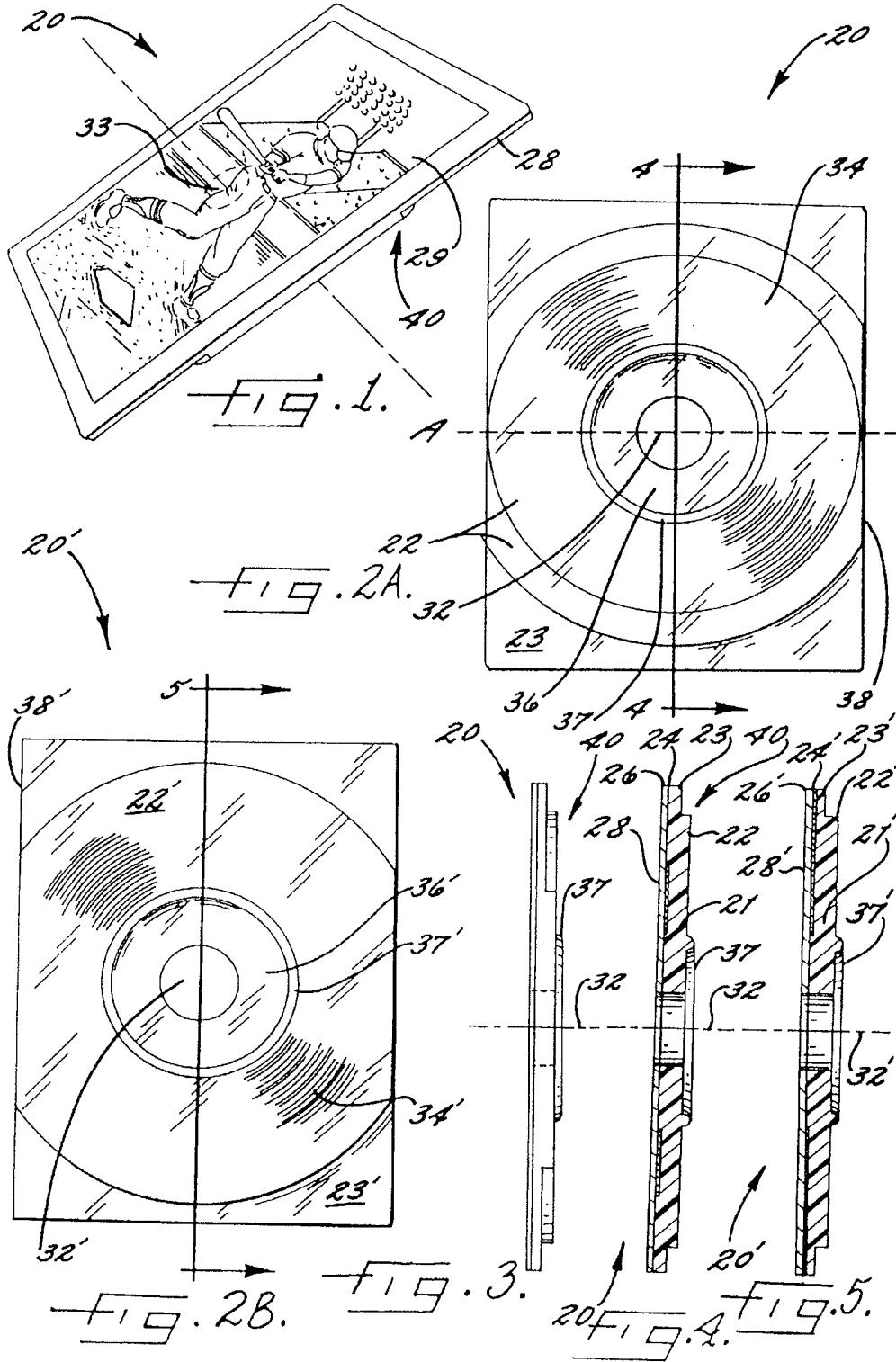


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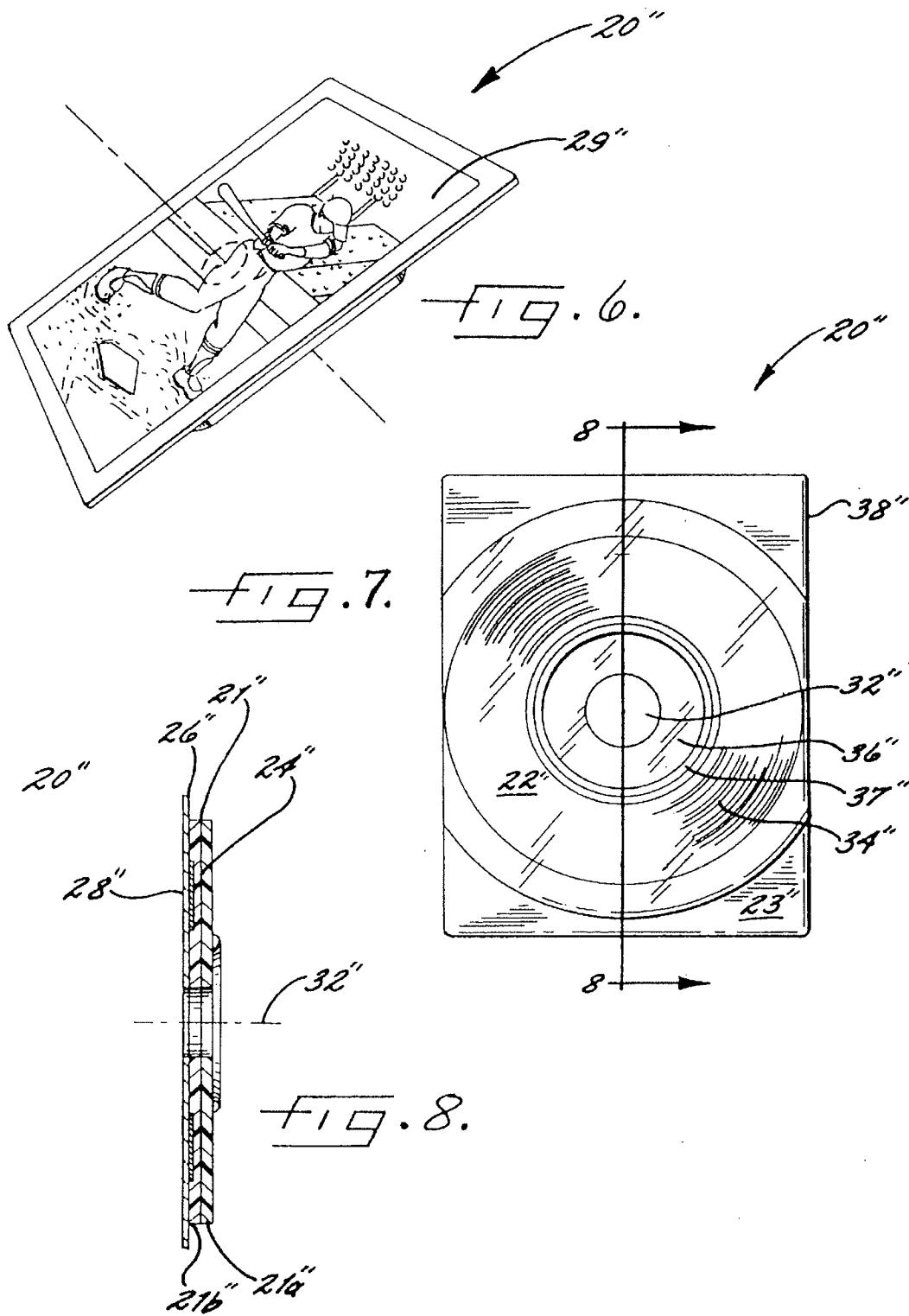


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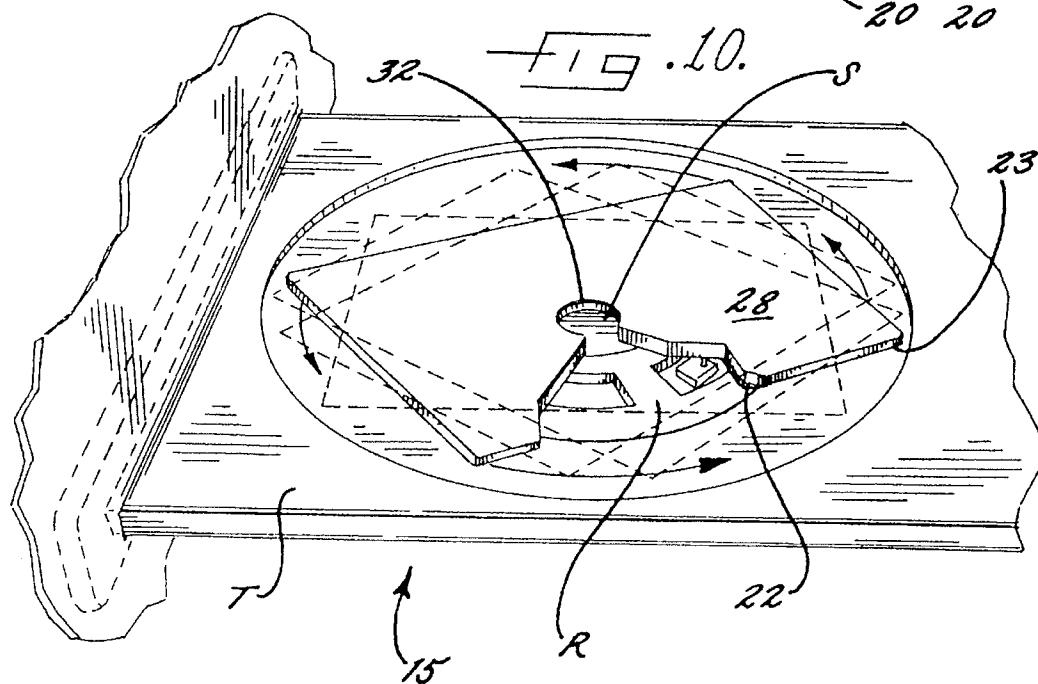
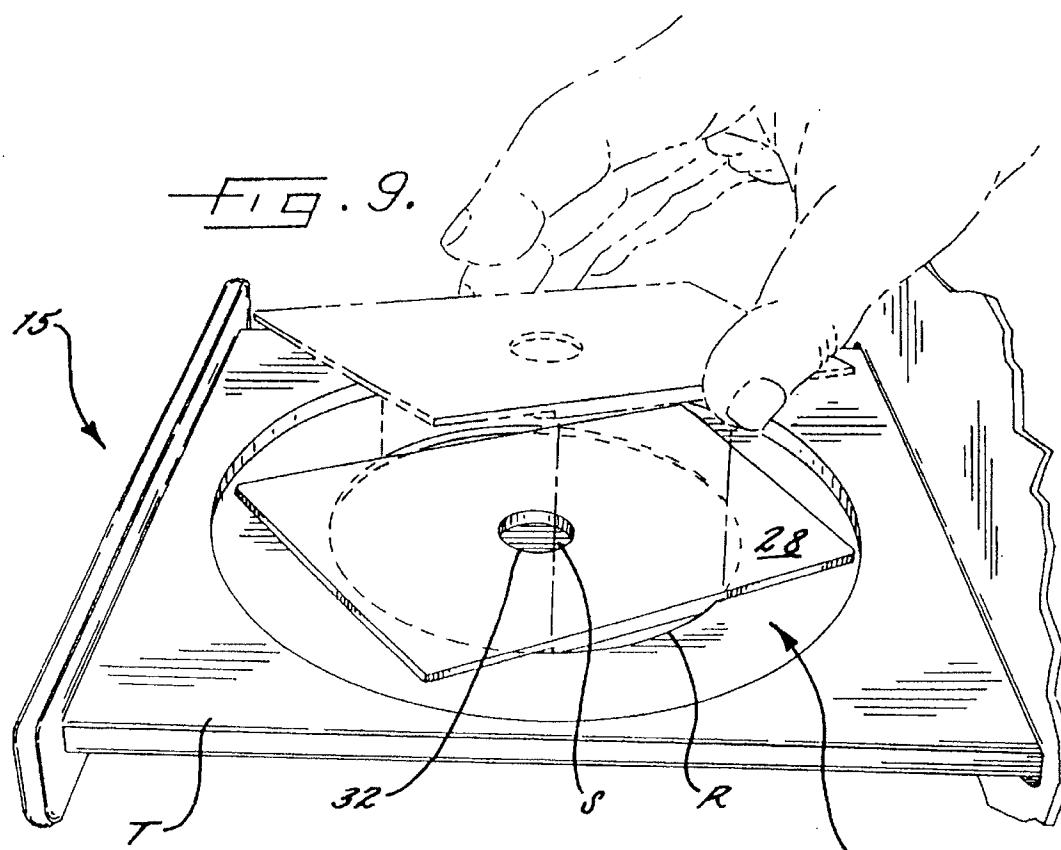


U.S. Patent

Jun. 20, 2000

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6,078,557



METHOD OF USING OPTICAL COMPACT DISC

This application is a continuation of Ser. No. 08/856,915 filed on May 15, 1997, now U.S. Pat. No. 5,982,736, the disclosures of which are hereby incorporated by reference in their entirety.

FIELD OF THE INVENTION

This invention relates to novelty trading items and, more particularly, to novelty trading items for storing and communicating data to enthusiasts, hobbyists, and collectors.

BACKGROUND OF THE INVENTION

Over the years the trading card industry has developed as both a novelty item and a collectors item. As time goes by, the value of many of these trading cards which have printed indicia thereon has increased so that the trading card industry has grown significantly over the years and many trading cards have substantially increased in value. As technology has changed, however, various types of trading cards and methods of storing and communicating data have been developed.

The concept of associating card devices which store and communicate information to a user with indicia or an image thereon has been known for many years. Examples of such devices can be seen in U.S. Pat. No. 3,691,312 by Petersen titled "Tape Recording Apparatus And System Having A Very Thin Cassette," U.S. Pat. No. 4,904,853 by Yokokawa titled Dual-Function Information-Carrying Sheet Device," U.S. Pat. No. 5,411,259 by Pearson et al. titled "Video Sports Game System Using Trading Cards," and U.S. Pat. No. 5,433,035 by Bauer titled "Talking Entertainment Card." These prior card devices, however, either used older methods of storing and communicating information such as cassettes or used integrated circuit technology. Accordingly, these prior methods can be expensive and complex to manufacture even in large volumes and neither understood nor appreciated the benefits, capabilities, design, or construction of optical digital data storage devices, and more particularly optical compact discs. Only recently has the technology and concepts related to the use of optical digital data storage devices really increased and been accepted in the market so that the relative price of optical digital data storage media has decreased dramatically.

Conventional compact discs, for example, are conventionally fabricated in either 80 millimeter ("mm") or 120 mm sizes and are formed of generally rigid plastic discs. As understood by those skilled in the art, the discs are often formed by the use of a mold-based replication system using injection molding techniques. Each compact disc includes a series of either circular or spiral data tracks which are illuminated and read by a source of coherent light such as a laser. In producing these compact discs, data is optically mastered from data files and positive copies of the data are made. Die stampers are produced from electroplated shims, and discs are molded from the negative images on the die stampers. The discs are then individually metalized, and a lacquer coating is applied to each disc. The layer of rigid plastic positioned between each data track and the source of coherent light provides structural rigidity, protects the data tracks, and also functions as a single integral lens element to refract and focus the coherent light beam onto a selected data track. A disc label is also printed, and the disc inserted into a clam shell or other package for shipment to customers.

Recently, however, other thin film digital data storage medium and methods of manufacturing digital data storage

media have been developed including for use with trading cards. An example of this thin film digital data storage medium and related methods can be seen in U.S. Pat. No. 5,579,296 by Smith et al. titled "Optically Readable Thin Film Digital Data Storage Medium." These recently developed trading cards, however, require extensive and new manufacturing investments, require a special adaptor to make the trading cards compatible with compact disc playing systems, and can be inhibited by marketing and manufacturing constraints, including the additional special adaptor, which can make this recently developed technology less commercially feasible.

SUMMARY OF THE INVENTION

With the foregoing in mind, the present invention provides a trading card optical compact disc and methods of using a compact disc which are readily compatible with existing disc readers and relatively inexpensive to manufacture. The present invention also advantageously provides a trading card optical compact disc and method of forming a trading card that stores and communicates trading card information to a user of a disc reader in a manner that is relatively easy to manufacture in conjunction with known optical compact disc manufacturing techniques and thereby does not require extensive additional molding and tooling costs. The present invention further provides a trading card optical compact disc which does not require a separate special adapter for compatibility with existing disc readers.

More particularly, a trading card optical compact disc and method of using and forming the compact disc are provided which are compatible with a disc reader having a centrally located spindle and a seating ring for supporting and rotating a compact disc positioned thereon. The trading card optical compact disc according to a first embodiment of the present invention preferably has at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. A second metallic layer is formed on at least portions of the first plastic layer, and a third protective layer is formed on at least the second layer for protecting the metallic layer. An indicia bearing fourth layer is formed on the third layer and has a generally planar upper surface for displaying indicia therefrom. An opening extends through the first, second, third, and fourth layers in a medial portion thereof. Trading card interface seating means is preferably integrally formed in at least the first layer for seating the trading card onto a loading tray of a disc reader so as to interface with only portions of the seating ring and not other portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc.

According to the present invention, the trading card seating means is preferably provided by the at least a first plastic layer which has a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height. The major elevational portion has the encoded digital data thereon, and the minor elevational portion is preferably devoid of the encoded digital data. For alignment, balancing, and compatibility purposes, the major elevational portion is advantageously formed in a medial portion of the trading card and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extend generally lin-

early between each of the first pair of spaced-apart outer peripheries. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries. The encoded digital data of the major elevational portion of the first layer is formed within a circular data zone and preferably does not cover, i.e., less than, the entire surface area of the major elevational portion of the first layer. The circular data zone has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches. The circular data zone is preferably capable of storing between 60–70 Megabytes of information or data therein in some compact disc formats, e.g., audio or CD-ROM, or 450–500 Megabytes in other compact disc formats, e.g., digital video. A first non-metallic zone surrounds and extends outwardly a predetermined distance from the medial opening, and a second non-metallic zone extends inwardly from the rectangular outer perimeter of the trading card optical compact disc a predetermined distance.

By the provision of the trading card interface seating means, the trading card optical compact disc of the present invention advantageously allows a user thereof to readily position the disc into a conventional disc reader with any separate special attachments, adapters, or fasteners. The positioning of and construction of the trading card interface seating means also enables the disc to balance and rotate effectively within a conventional disc reader. By not requiring a separate adapter, the trading card optical compact disc advantageously can be easier to use and, in some embodiments, easier and less expensive to manufacture.

A method of using a trading card optical compact disc to communicate digitally encoded data to a user of an optical disc reader is also provided according to the present invention. The method preferably includes positioning a trading card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of a disc reader so that the compact disc interfacingly seats onto only portions of a seating ring and not other portions of the seating ring of the disc reader.

Additionally, methods of forming a trading card optical compact disc are provided according to the present invention. A method preferably includes molding at least a first plastic rectangular layer having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. The at least a first plastic layer preferably includes a major elevational portion having a first predetermined height and a minor elevational portion having a second predetermined height. The major elevational portion has the encoded digital data thereon and the minor elevational portion is devoid of the encoded digital data.

Another method of forming a trading card optical disc preferably includes positioning a compact disc having a pattern of digital data encoded thereon onto a medial portion of a surface of a trading card having a width of about 2.5 inches and a length of about 3.5 inches, the combination of the compact disc and the trading card having a major elevational portion and a minor elevational portion so that the major elevational portion interfacingly seats the combination onto a loading tray of a disc reader so as to interface with only portions of the seating ring and not other portions of the seating ring of the disc reader and to read digital data stored thereon from the trading card optical compact disc. The major elevational portion has the encoded digital data thereon, and the minor elevational portion is preferably

devoid of the encoded digital data. The major elevational portion has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion. Each of the first pair of space-apart outer side peripheries arcuately extends between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extends generally linearly between each of the first pair of spaced-apart outer peripheries.

Because the trading card optical compact disc and associated methods were conceived and developed while keeping in mind the commercial viability and ease of manufacturing, the trading card optical compact disc is preferably formed using conventional compact disc manufacturing techniques. This, for example, advantageously allows training, tooling, and other associated manufacturing costs to be reduced and advantageously provides incentives for manufacturers to more readily accept the technology for manufacturing purposes. In contrast to other known concepts, by providing incentives to make this technology readily manufacturable by existing compact disc manufacturers, the present invention achieves a significant goal in reducing the overall price of the end product to ultimate purchasers.

BRIEF DESCRIPTION OF THE DRAWINGS

Some of the features, advantages, and benefits of the present invention having been stated, others will become apparent as the description proceeds when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of trading card optical compact disc according to the present invention;

FIG. 2A is a bottom plan view of a trading card optical compact disc according to a first embodiment of the present invention;

FIG. 2B is a bottom plan view of a trading card optical compact disc according to a second embodiment of the present invention;

FIG. 3 is a side elevational view of a trading card optical compact disc according to a first embodiment of the present invention;

FIG. 4 is a vertical sectional view of a trading card optical compact disc according to taken long line 4—4 for FIG. 2A according to a first embodiment of the present invention;

FIG. 5 is a vertical sectional view of a trading card optical compact disc taken a long line 5—5 of FIG. 2B according to a second embodiment of the present invention;

FIG. 6 is a perspective view of a trading card optical compact disc according to the third embodiment of the present invention;

FIG. 7 is a bottom plan view of a trading card optical compact disc according to the third embodiment of the present invention;

FIG. 8 is a vertical sectional view of a trading card optical compact disc taken along the line 8—8 of FIG. 7 according to the third embodiment of the invention;

FIG. 9 is a perspective view of a trading card optical compact disc being positioned into a disc reader according to a first embodiment of the present invention; and

FIG. 10 is a fragmentary perspective view of a trading card optical disc positioned in a disc reader and being rotated for reading digital data therefrom.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in

which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout, and prime and double prime notation are used to indicate similar elements in alternative embodiments.

FIG. 1 illustrates a perspective view of a trading card optical compact disc 20 according to an embodiment of the present invention. The trading card optical compact disc 20 is preferably compatible with a disc reader 15 (see FIGS. 9-10) which includes a centrally located spindle S and a seating ring R of a loading tray T for supporting and rotating a compact disc ("CD") positioned thereon. The trading card optical compact disc 20 has at least a first plastic rectangular layer 21 having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon, i.e., pits and tracks as understood by those skilled in the art. The plastic of the first layer 21 is preferably a polycarbonate material or other optically transparent embossable plastic material as understood by those skilled in the art.

Various formats or data categories, including compact disc audio data, digital video disc ("DVD"), and/or compact disc read-only-memory ("ROM") data can be embossed into and stored on the first layer 21 by techniques known to those skilled in the art. For trading card applications (see FIG. 1), for example, digital data including visual information of photographs, video, textual information such as a person's or team's statistics and biographies, historical information, music, narration, and other data can be stored and recalled at will be a user of a disc reader 15. As understood by those skilled in the art, these trading card applications, for example, can include sports, music, entertainment, publishing, book, magazine, topical information, or various other types and formats of trading cards.

A conventional compact disc reader 15, for example, can include a loading tray T having a centrally located spindle S and a seating ring R for supporting and rotating a compact disc having planar upper and lower surfaces and embedded data tracks consisting of the encoded digital data. A compact disc reader 15 also has a digital data reading system which includes a source of light positioned for generating a light beam to illuminate the data tracks. A light beam is reflected from the data tracks and is modulated by the encoded digital data. A digital reading system of the compact disc reader 15 receives and converts a corresponding electrical signal for processing the read data, e.g., by a microprocessor-based decoding system.

Preferably, as illustrated in FIGS. 2A-2B, 3-5 and 8, a second metallic layer 24 is formed on at least portions of the first plastic layer 21, e.g., portions of or the entire major elevational portion 22 of the first plastic layer (see FIGS. 2A and 4). The metallic layer 24 preferably includes an aluminum material, such as conventionally used with forming optical compact discs, silver material, gold material, or other reflective metal material. The second layer 24 preferably provides a reflective surface for the light beam after it passes through the first optically transparent plastic layer 21 when attempting to read the digitally encoded data from the disc 20. As illustrated in FIGS. 2B and 5, for ease of manufacturing and aesthetic purposes, a second embodiment of the trading card 20' illustrates that the second layer 24' can also extend substantially the full length and width of the trading card optical compact disc 20'. The second embodiment also

includes a first layer 21', a major elevational portion 22', the second layer 24', a third layer 26', a fourth indicia bearing layer 28', and a medial opening 32' extending therethrough (see also opening 32" of FIG. 8) as illustrated. In either the first or second embodiments of the trading card optical compact disc 20, 20', however, a non-metallic zone 23, 23' (see also 23" of FIG. 7) is preferably formed around the entire peripheries of the trading card optical compact disc 20, 20'.

Additionally, a third protective layer 26 is preferably formed on at least the second layer 24 for protecting the metallic layer 24 such as from chipping, flaking, or other damage. The third layer 26 is preferably a lacquer material or other thin hard coat material which is formed on the first and second layers 21, 24 to enhance the scratch resistance and provide other protection for these layers 21, 24. A fourth indicia bearing layer 28 is preferably formed on the third layer 26 and has a generally planar upper surface for displaying indicia 29 therefrom (see also indicia 29" of FIG. 6). The indicia 29 is preferably a photograph, sketch, textual information, or other images formed by ink or other material formed or positioned onto either the lacquer layer or formed by another material, e.g., paper or plastic, formed on or adhered to the lacquer layer 26. Also, for example, if the indicia bearing layer is a paper material adhered to the lacquer layer 26, then an adhesive is preferably positioned therebetween. The thickness of the combination of the first, second, third, and fourth layers 21, 24, 26, 28 of the first and second embodiments is preferably less than about 0.06 inches or 1.5 mm.

As best shown in FIGS. 6-8, the thickness of the combination of the first, second, third, and fourth layers 21", 24", 26", 28" of the third embodiment of a trading card optical compact disc 20", e.g., a DVD format, which preferably uses a digital video data format is also preferably less than about 0.06 inches or 1.5 mm. This embodiment, as understood by those skilled in the art, preferably has at least two plastic layers 21a", 21b" each which are less than 0.03 inches or 0.75 inches or which form a composite layer and defines a major elevational portion 22" as illustrated in the other embodiments. These two plastic layers 21a", 21b", however, are also preferably positioned prior to the metallic layer or second layer 24". These plastic layers 21a", 21b" are preferably used for data encoding, focusing, and image enhancement, especially in the DVD format as understood by those skilled in the art, have smaller pits, and form two levels of digitally encoded data.

An opening 32 preferably extends through the first, second, third, and fourth layers 21, 24, 26, 28 in a medial portion thereof (see FIGS. 1-2B and 6-7). The trading card optical compact disc 20 preferably has a perforated opening cover 33 which preferably attaches along perforation lines to either the third or fourth layers 26, 28. The opening cover 33 is preferably packaged and shipped with the trading card optical compact disc 20 so that the purchaser or user of the card can detach or remove the opening cover 33 from the card 20 for positioning the card 20 onto the spindle S of a disc reader 15. The opening 32 preferably has a diameter of about 0.6 inches, i.e., about 15 mm, and is primarily used to mount the card 20 onto the spindle S of a disc reader 15.

As illustrated in FIGS. 2A-2B, 3-5, and 7-8, a trading card optical compact disc 20 of the present invention also preferably has trading card interface seating means 40, e.g., preferably provided by a trading card interface seat, integrally formed in at least the first layer 21 for seating the trading card 20 onto a loading tray T of a disc reader 15 so as to interface with only portions of the seating ring R and

not other portions of the seating ring R of the disc reader 15 and to read digital data stored thereon from the trading card optical compact disc 20. The trading card seating means 40 preferably includes at least the first plastic layer having a major elevational portion 22 having a first predetermined height and a minor elevational portion 23 having a second predetermined height. The first predetermined height preferably is about 0.05 inches. The major elevational portion 22 has the encoded digital data thereon, and the minor elevational portion 23 is preferably devoid of the encoded digital data. By the provision of the trading card interface seating means 40, the trading card optical compact disc 20 therefore advantageously does not require a separate special adapter for compatibility with existing disc readers. The positioning of and construction of the trading card interface seating means 40 also enables the disc 20 to balance and rotate effectively within a conventional disc reader 15.

The major elevational portion 22 is formed in a medial portion of the trading card 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extend generally linearly between each of the first pair of spaced-apart outer peripheries. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion 22 are centered about an axis A extending through the medial opening 32 and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries 38 (see also 38' of FIG. 2B and 38" of FIG. 7). A radius extending from a medial portion of the medial opening 32 to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion 22 is less than 1.6 inches.

As perhaps best illustrated in FIG. 2A, the encoded digital data of the major elevational portion 22 of the first layer 21 is formed within a circular data zone 34 (see also 34' of FIGS. 2B and 5 and 34" of FIG. 7) and preferably does not cover, i.e., is less than, the entire surface area of the major elevational portion 22 of the first layer 21. The circular data zone 34 has a first inner circular periphery having a radius of at least 0.6 inches and a second outer circular periphery having a radius of less than 1.25 inches. The circular data zone 34 is preferably capable of storing between 60-70 Megabytes of digital information or digital data therein in some formats, e.g., audio or CD-ROM and capable of storing between 450-500 Megabytes of digital information in other formats, e.g., DVD. A first non-metallic zone 36 (see also 36' of FIGS. 2B and 5 and 36" of FIG. 7) surrounds and extends outwardly a predetermined distance from the medial opening 32. A second non-metallic zone 38 extends inwardly from the rectangular outer perimeter of the trading card optical compact disc 20 a predetermined distance. The first non-metallic zone 36 preferably includes a stacking ring 37 (see also 37' of FIGS. 2B and 5 and 37" of FIG. 7) surrounding the opening 32 for stacking another optical compact disc thereon such as used during mass production. It will be understood by those skilled in the art, however, that the stacking ring 37 is not necessary in the construction of the trading card optical compact disc 20 according to the present invention.

As illustrated in FIGS. 1-10, the present invention also advantageously provides methods of using and methods of forming a trading card optical compact disc 20 according to the present invention. As perhaps best illustrated in FIG. 9,

a method of using a trading card optical compact disc 20 to communicate digitally encoded data to a user of a disc reader 15 preferably includes positioning a trading card optical compact disc 20 having an opening 32 extending through a medial portion thereof onto a spindle S of a disc reader 15. The compact disc 20 preferably interfacingly seats onto only portions of a seating ring R and not other portions of the seating ring R of the disc reader 15. The trading card optical compact disc 20 can also be rotated so as to read digitally encoded data therefrom (see, e.g., FIG. 10).

A method of forming a trading card optical compact disc 20 according to the present invention preferably includes molding at least one plastic rectangular layer 21 having a width of about 2.5 inches and a length of about 3.5 inches and having a pattern of digital data encoded thereon. Prior to this molding step, however, and as understood by those skilled in the art, data for the disc 20 is optically, e.g., preferably by laser techniques, mastered from data files or other software programs. The master is then electro-plated with a metal material, e.g., silver, and prepped for replicating positive mold copies or shims. Die stampers are produced from the electro-plated shims. The plastic layer 21 is then formed by injection molding from a negative image on a die stamper. Alternatively, as understood by those skilled in the art, two plastic layers 21a", 21b" can be formed as illustrated in FIG. 8 for DVD formats. The plastic layer 21 preferably includes a major elevational portion 22 having a first predetermined height and a minor elevational portion 23 having a second predetermined height. The major elevational portion 22 preferably has the encoded digital data thereon, and the minor elevational portion 23 is preferably devoid of the encoded digital data. These major and minor elevational portions 21, 24 and the digitally encoded data are preferably formatted and implemented in the optical mastering step.

The major elevational portion 22 is preferably formed in a medial portion of the trading card optical compact disc 20 and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion 22. Each of the first pair of space-apart outer side peripheries arcuately extend between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extending generally linearly between each of the first pair of spaced-apart outer peripheries. The encoded digital data of the major elevational portion 22 of the plastic layer 21 is preferably formed within a circular data zone 34 and comprises less than the entire surface area of the major elevational portion 22 of the plastic layer 21. The molding of the plastic layer 21 preferably includes molding an opening 34 extending through a medial portion of the plastic layer 21.

The method can also include applying a metallic layer 24 on at least portions of the plastic layer 21 and applying a third protective layer 26 on at least the metallic layer 24 for particularly protecting the metal material of the metallic layer 24. The metallic layer 24, for example, can be applied by metalizing the plastic layer 21 through a high speed spinning process or other metalizing processes known to those skilled in the art. The third layer 26 is preferably applied by pouring or spraying a curable liquid onto the second layer 24 in a controlled manner. The method can further include applying an indicia bearing layer 28 on the third layer 26. The indicia bearing layer 28 preferably has a generally planar upper surface for displaying indicia 29 therefrom. The formed disc 20 can then be packaged in a clam shell package, a custom package, or other compact disc package as understood by those skilled in the art. The present invention thereby advantageously provides a trading

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card optical compact disc **20** and method of forming a trading card that stores and communicates trading card information to a user of a disc reader **15** in a manner that is relatively easy to manufacture in conjunction with known optical compact disc manufacturing techniques, e.g., an in-line production process, and thereby does not require extensive additional molding and tooling costs.

A method of forming a trading card optical compact disc **20** according to another embodiment of the present invention includes positioning a compact disc having a pattern of digital data encoded thereon onto a medial portion of a surface of a trading card having a width of about 2.5 inches and a length of about 3.5 inches. The combination of the compact disc and the trading card preferably have a major elevational portion and a minor elevational portion so that the major elevational portion interfacingly seats the combination onto a loading tray **T** of a disc reader **15** so as to interface with only portions of the seating ring **R** and not other portions of the seating ring **R** of the disc reader **15** and to read digital data stored thereon from the trading card optical compact disc **20**. The major elevational portion **22** has the encoded digital data thereon and the minor elevational portion **23** is preferably devoid of the encoded digital data. The major elevational portion **22** has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion **22**. Each of the first pair of space-apart outer side peripheries arcuately extends between each of the second pair of space-apart outer side peripheries. Each of the second pair of space-apart outer side peripheries extends generally linearly between each of the first pair of spaced-apart outer peripheries. The major elevational portion **22** is formed in a medial portion of the trading card **20** and has first and second pairs of spaced-apart outer side peripheries defining outer boundaries of the major elevational portion **20**. Each of the first pair of space-apart outer side peripheries arcuately extending from each of the second pair of space-apart outer side peripheries. Also, each of the second pair of space-apart outer side peripheries extending generally linearly from each of the first pair of spaced-apart outer peripheries. The combination preferably includes an opening **32** formed in a medial portion thereof. Each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion are centered about an axis extending through the medial opening **32** and generally perpendicular to the linearly-extending second pair of space-apart outer side peripheries. A radius

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extending from a medial portion of the medial opening to each of the arcuately-extending first pair of spaced-apart outer side peripheries of the major elevational portion is less than 1.6 inches.

5 Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope of the appended claims.

That which is claimed is:

15 1. A method of using a trading card optical compact disc to communicate digitally encoded data to a user of an optical disc reader, the method comprising the step of positioning the trading card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of the disc reader so that the trading card optical compact disc when positioned in an inner annular-shaped recess of the loading tray interfacingly abuts only portions of a periphery of the inner annular-shaped recess and not the entire periphery of the inner annular-shaped recess, the loading tray having the inner annular-shaped recess positioned in an outer annular-shaped recess so that the inner annular-shaped recess defines an inner optical compact disc seating ring positioned adjacent to the disc reader.

20 2. A method as defined in claim 1, further comprising the step of rotating the trading card optical compact disc so as to read digitally encoded data therefrom.

25 3. A method of using a trading card optical compact disc to communicate digitally encoded data to a user of an optical disc reader, the method comprising the step of positioning the trading card optical compact disc having an opening extending through a medial portion thereof onto a loading tray of a disc reader so that arcuate portions of the trading card optical compact disc when positioned within an annular-shaped recess of the loading tray which defines an optical compact disc seating ring interfacingly abut onto only portions of a periphery of the seating ring and non-arcuate portions of the trading card optical compact disc when also positioned within the annular-shaped recess do not interfacingly abut with, and are secant to, the periphery of the seating ring.

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

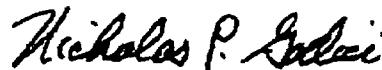
PATENT NO. : 6,078,557
DATED : June 20, 2000
INVENTOR(S) : GERALD A. PIERSON

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the cover page [76] Inventor: Please delete "9931 Rivercrest Ct., Orlando, Fla. 32825" and insert -- 7361 Bordwine Drive, Orlando, FL 32818 -- therefor.

Signed and Sealed this
Third Day of April, 2001

Attest:



NICHOLAS P. GODICI

Attesting Officer

Acting Director of the United States Patent and Trademark Office

EXHIBIT H



US006016298A

United States Patent [19]
Fischer

[11] Patent Number: **6,016,298**
[45] Date of Patent: **Jan. 18, 2000**

[54] CALLING CARD

[75] Inventor: **Gerhard Fischer**, Emmen, Switzerland[73] Assignee: **Adivan High Tech AG**, Wangen,
Switzerland[21] Appl. No.: **09/049,697**[22] Filed: **Mar. 27, 1998**

[30] Foreign Application Priority Data

Jun. 25, 1997 [CH] Switzerland 1537/97
Mar. 5, 1998 [CH] Switzerland 0526/98[51] Int. Cl. ⁷ **G11B 7/02**[52] U.S. Cl. **369/75.1; 235/487**[58] Field of Search **369/75.1; 235/487**

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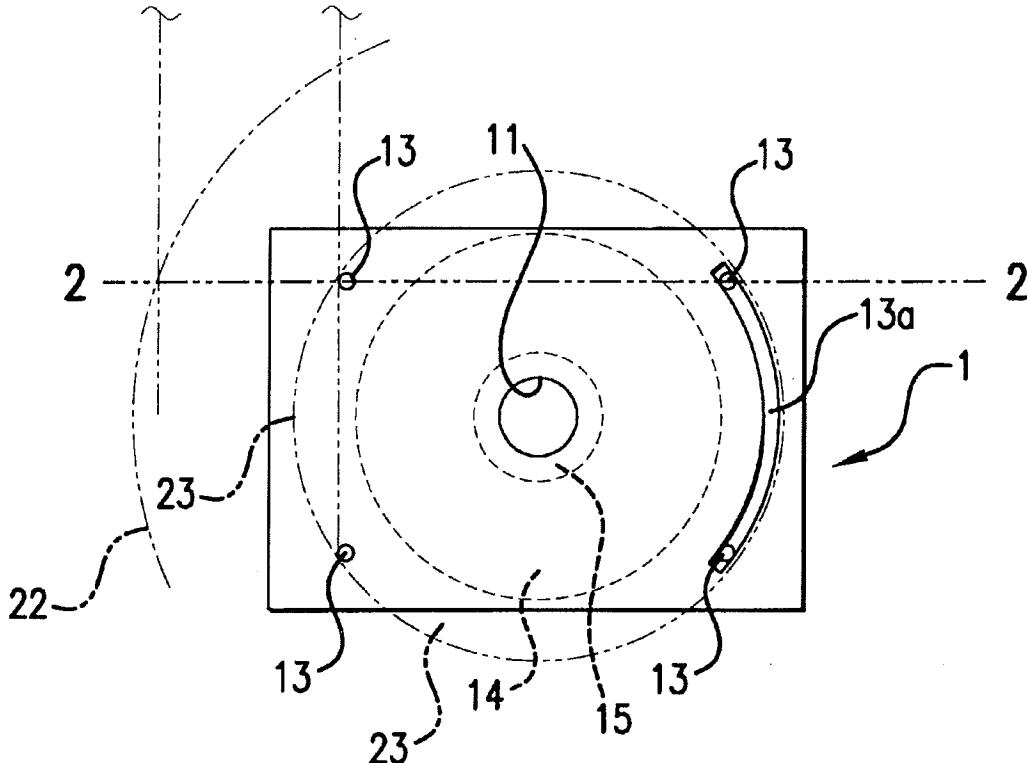
Primary Examiner—Harold I. Pitts

Attorney, Agent, or Firm—Pauley Petersen Kinne & Fejer

[57] ABSTRACT

A calling card which can be inserted into a conventional CD drive and read. The calling card is centered in a CD drive. Thus, the calling card becomes a calling card CD with a printed upper side, which can be visually detected by an eye, and an underside on which data can be recorded and read by a computer.

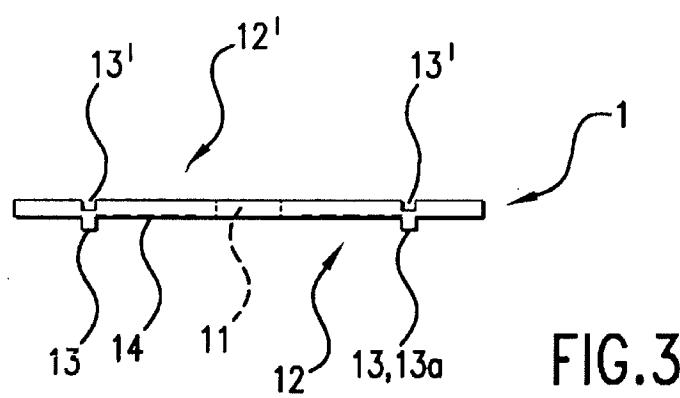
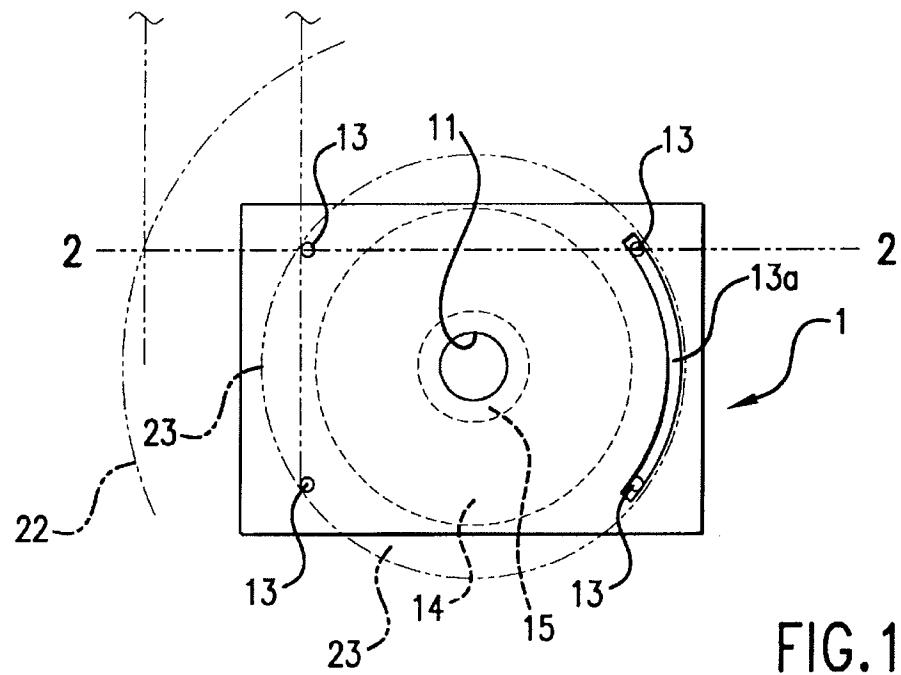
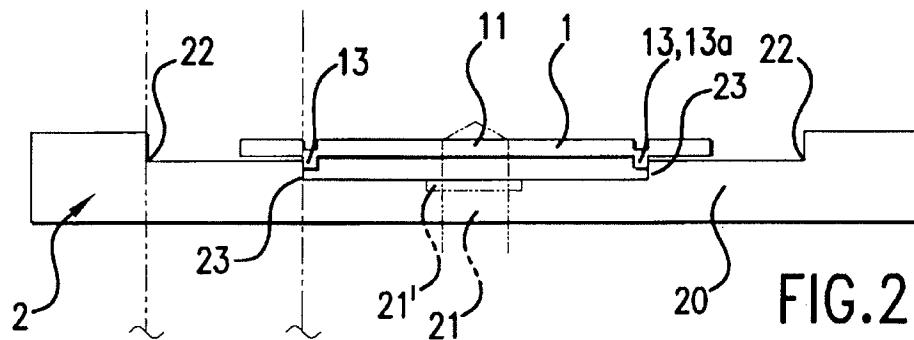
13 Claims, 1 Drawing Sheet



U.S. Patent

Jan. 18, 2000

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1**CALLING CARD****BACKGROUND OF THE INVENTION****1. Field of The Invention**

This invention relates to a calling card made of plastic with a printed upper side with directly visually readable information.

2. Description of Prior Art

Calling cards have been known and used for a long time. Known calling cards are printed on paper or other base stock and have a name, company designation and other visually recognizable information. Since the format is relatively small, only a relatively limited amount of information can be printed on known calling cards. The amount of information is sufficient when directly presented to a person being visited. However, when later looking at known calling cards it would be nice if considerably more information would be available, such as related to the presenter, or respectively the company, in order to jog and complete the memory of the person being visited.

SUMMARY OF THE INVENTION

It is one object of this invention to provide a calling card on which information can be printed in a conventional way, and which also makes it possible to supply a large amount of information.

This object is attained by this invention as disclosed in the claims.

An additional advantage of this invention is that for example the complete company information, such as the company program, catalogs, order forms and, for example, even an automatic internet access to the home page of the company, can be provided as information on the calling card.

A further advantage of this invention is that the calling card in accordance with this invention can also be produced in different formats.

BRIEF DESCRIPTION OF THE DRAWINGS

This invention will be described below in connection with the drawings.

FIG. 1 shows a bottom view of one preferred embodiment of a calling card in accordance with this invention;

FIG. 2 shows a front view of the calling card of FIG. 1, inserted into a CD-ROM drive; and

FIG. 3 shows a cross-sectional view of a calling card in accordance with one preferred embodiment of this invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

This invention will now be described in more detail in connection with the drawings.

One basic concept of this invention is a combination of a calling card with a CD-ROM. On one hand, known calling cards are mostly made of paper, semi-cardboard or plastic. Known calling cards have a defined format, approximately the same as is customary and widespread all over the world in connection with credit cards. On another hand, various companies have already shipped CDs with music or with catalog and company information. However, these cannot be inserted in calling card holders, because they are too large and they are round. This also applies to mini-CDs.

The calling card of this invention now makes both possible. This is a CD with format corresponding to that of a

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calling card, but nevertheless can be inserted into a normal CD drive and read. Thus, the calling card of this invention is a calling card CD.

The usual CD drive is known to contain a central drive spindle and a circular-shaped drive centering device, into which a CD is inserted. The drive centering device centers the inserted CD, and the CD is driven by the drive spindle in the drive. During operation the CD is guided in the drive centering device on a small air cushion and is driven by the spindle and the central positioning device. So that normal CDs and mini-CDs can be used in the same drive, centering the CDs is accomplished in two stages matched to the two different diameters. It is known to mechanically separate the drive and the centering device, so that the CDs are not mechanically stressed and damaged in the area of the drive opening.

For advertising purposes, some conventional CDs are produced in defined shapes which differ from the round disk. But such conventional CDs have a shape wherein the edge always corresponds at several places to the normal circumference of CDs. If such CDs are inserted into the drive, the spindle engages the central drive opening of the CD, and the CD rests with several places of its circumference inside on the centering edge of the drive centering device. These CDs are called "shaped CDs". Their shape is milled from a customary round CD.

However, a CD of the size and shape of a calling card is too small for resting against the drive centering device. In no way does the format of a calling card correspond to the format of a normal or a mini-CD. It is important to center a CD in a conventional CD drive. According to this invention, the calling card is designed as a CD-ROM in a calling card format and has suitable means for centering the calling card, designed as a CD-ROM, in the CD drive.

A calling card in accordance with this invention is shown in FIG. 1, in a bottom view. The calling card of this invention has a format which is customary for calling cards. Like a conventional CD, the calling card is made of the same material and in the same way. As shown in FIG. 1, drive opening 11, which is bordered by a placement area 15, is located in the center. Adjoining the placement area 15 is the data area 14, on which data can be written and which can be read in the CD drive. A number of centering pins 13, in this case preferably four, are arranged on a circle. The centering pins 13 are arranged in such a way that, when the calling card is inserted into the CD drive, the centering pins 13 rest against the centering shoulder 23, as shown in FIG. 2, and maintain the calling card centered. The means for centering in the CD drive can, in place of a number of individual nubs or pins 13, alternatively comprise centering beads 13a, which are arranged on both sides symmetrically relative to the drive opening 11, as shown on one side only in FIG. 2. The centering beads 13a form a sector of a circle, wherein the radius is selected such that the outer edges of the centering beads 13a rest against the centering shoulder 23, with minimal play.

In FIG. 2, a calling card 1 in accordance with this invention is inserted into a drive drawer 20 of a CD drive 2, as shown in a section along line A—A in FIG. 1. The drive drawer 20 has a first centering shoulder 22 for a conventional CD and a second centering shoulder 23 for a conventional mini-CD. The drive spindle 21 and the drive placement device 21' of the drive and the drive opening 11 of the calling card 1 are shown in broken lines since they are not

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located in the section A—A. With downward projecting centering means 13, 13a, the calling card 1 rests against the centering edge 23 of the drive for conventional mini-CDs, which assures dependable centering of the calling card 1 in the drive. The calling card 1 simultaneously rests on the drive placement device 21', and the drive spindle 21 projects through the drive opening 11. A minimal air cushion is formed between the calling card 1 and the drawer with respect to the centering edge 23, during rotation of the calling card 1. In this way the calling card 1 is clearly and cleanly centered when inserted into the drive and is not mechanically stressed when running.

The production of the shape does not take place by milling the shape out of a finished CD, but by a stamping process. It is thus possible to produce the shape and the means for centering the calling card CD 1 in one single production step. The stamping process must be performed slowly, so that the shape is cleanly cut around the circumference and the centering pins can be formed in the process, and so that when producing the centering pins 13a deformation, but not a break-through, occurs. In the process the centering pins 13 are slowly pushed downward by small dies in the stamping tool and the material is plastically deformed, creating minimal depressions 13' in the printed upper side 12'. During the stamping process the shape is stamped out on the one hand and, on the other hand, the material is only deformed in the area of the centering pins 13 to be formed. This procedure makes it possible to perform the production of the calling card 1 as a calling card CD 1 in one process step and therefore very cost-effectively and gently. It is of course also possible to glue the centering pins 13 to the underside 12 in a separate process step.

The calling card 1 can be imprinted, as before, on the upper side with the name, address and further information. The underside, the data side, is a customary CD, on which data which can be read by a computer can be inscribed. For example, a company profile, a company catalog and similar information, including multimedia, can be recorded. It is also possible to store an entire computer program on the calling card 1. Automatic access to a computer or a home page are mentioned as examples.

The technique for producing the calling card 1 and the arrangement of the centering pins 13 now makes it possible to design the calling card 1 in approximately any desired shape, such as with approximately any desired outer contour, since the calling card 1 is centered in the drive by the centering pins 13 and not by the exterior circumference. For example, such a calling card 1 can have the exterior contour of a company logo.

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What is claimed is:

1. A plastic calling card with an upper side printed with directly visually readable information, comprising: an underside (12) of the calling card having electronically processed data, which can be reproduced one of optically and acoustically by a CD drive, and the plastic calling card having means for receiving the plastic calling card in a centered position in a CD drive (2).
2. The calling card in accordance with claim 1, wherein the means comprise a plurality of centering pins (13) projecting downward from the underside (12) wherein the centering pins (13) are arranged in such a way that the centering pins (13) at least approximately rest against a centering shoulder (23) for a mini-CD when the calling card (1) is in the CD drive (2).
3. The calling card in accordance with claim 1, wherein the means comprise a plurality of centering beads (13a) projecting downward from the underside (12), wherein the centering beads (13a) are arranged to at least approximately rest against the centering shoulder (23) when the calling card (1) is inserted in the CD drive (2).
4. The calling card in accordance with claim 3, wherein one of the centering pins (13) and the centering beads (13a) are created by plastic deformation.
5. The calling card in accordance with claim 3, wherein one of the centering pins (13) and the centering beads (13a) are glued to the underside (12).
6. The calling card in accordance with claim 5, wherein the calling card (1) has an arbitrary peripheral shape.
7. The calling card in accordance with claim 6, wherein the arbitrary peripheral shape is created by a stamping process.
8. The calling card in accordance with claim 7, wherein one of the centering pins (13) and the centering beads (13a) and the shape is created in the stamping process.
9. The calling card in accordance with claim 2, wherein one of the centering pins (13) and the centering beads (13a) are created by plastic deformation.
10. The calling card in accordance with claim 2, wherein one of the centering pins (13) and the centering beads (13a) are glued to the underside (12).
11. The calling card in accordance with claim 1, wherein the calling card (1) has an arbitrary peripheral shape.
12. The calling card in accordance with claim 11, wherein the arbitrary peripheral shape is created by a stamping process.
13. The calling card in accordance with claim 12, wherein one of the centering pins (13) and the centering beads (13a) and the shape is created in the stamping process.

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